

No. 22-1386

**United States Court of Appeals
for the Federal Circuit**

ROKU, INC.,
Appellant,

v.

INTERNATIONAL TRADE COMMISSION,
Appellee,

and

UNIVERSAL ELECTRONICS, INC.
Intervenor.

Appeal from the United States International Trade Commission in
Investigation No. 337-TA-1200.

NONCONFIDENTIAL OPENING BRIEF OF APPELLANT

Jonathan D. Baker
DICKINSON WRIGHT RLLP
800 W. California Avenue, Suite 110
Sunnyvale, CA 94086
Phone: (408) 701-6180

Michael D. Saunders
DICKINSON WRIGHT PLLC
607 W 3rd Street
Austin, TX 78703
Phone: (512) 770-4208

Matthew J. Rizzolo
Brendan F. McLaughlin
ROPES & GRAY LLP
2099 Pennsylvania Avenue, NW
Washington, DC 20006-6807
Phone: (202) 508-4600

Andrew Thomases
ROPES & GRAY LLP
1900 University Avenue, 6th floor
East Palo Alto, CA 94303
Phone: (650) 617-4000

Matthew R. Shapiro
Michael A. Morales
ROPES & GRAY LLP
1211 Avenue of the Americas
New York, NY 10036
Phone: (212) 596-9000

Counsel for Roku, Inc.

CLAIMS*

1. A first media device, comprising:

- [a] a processing device;
- [b] a high-definition multimedia interface communications port, coupled to the processing device, for communicatively connecting the first media device to a second media device;
- [c] a transmitter, coupled to the processing device, for communicatively coupling the first media device to a remote control device; and
- [d] a memory device, coupled to the processing device, having stored thereon processor executable instruction;
- [e] wherein the instructions, when executed by the processing device,
 - [i] cause the first media device to be configured to transmit a first command directly to the second media device, via use of the high-definition multimedia communications port, to control an operational function of the second media device when a first data provided to the first media device indicates that the second media device will be responsive to the first command, and
 - [ii] cause the first media device to be configured to transmit a second data to a remote control device, via use of the transmitter, for use in configuring the remote control device to transmit a second command directly to the second media device, via use of a communicative connection between the remote control device and the second media device, to control the operational function of the second media device when the first data provided to the first media device indicates that the second media device will be unresponsive to the first command.

3. The first media device as recited in claim 1, wherein the second media device comprises a media sink device for the first media device acting as a media source device and wherein the first media device transmits media data to the media sink device via use of the high-definition multimedia interface communications port.

11. The first media device as recited in claim 1, wherein the transmitter comprises a radio frequency (RF) transmitter.

* Appellant has added annotations to each limitation of claim 1 that align with those used by the Commission. Appx12-13.

13. The first media device as recited in claim 1, wherein the first data provided to the first media device comprises data indicative of a success status of a test command that was transmitted to the second media device.
14. The first media device as recited in claim 13, wherein the test command is transmitted to the second media device by the first media device via use of the high-definition multimedia interface communications port.
15. The first media device as recited in claim 13, wherein the test command comprises a command transmitted to test a volume functional operation of the second media device.

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Form 9 (p. 1)
July 2020

**UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT**

CERTIFICATE OF INTEREST

Case Number 22-1386

Short Case Caption Roku, Inc. v. ITC

Filing Party/Entity Roku, Inc.

Instructions: Complete each section of the form. In answering items 2 and 3, be specific as to which represented entities the answers apply; lack of specificity may result in non-compliance. **Please enter only one item per box; attach additional pages as needed and check the relevant box.** Counsel must immediately file an amended Certificate of Interest if information changes. Fed. Cir. R. 47.4(b).

I certify the following information and any attached sheets are accurate and complete to the best of my knowledge.

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Name: Matthew J. Rizzolo

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1. Represented Entities. Fed. Cir. R. 47.4(a)(1).	2. Real Party in Interest. Fed. Cir. R. 47.4(a)(2).	3. Parent Corporations and Stockholders. Fed. Cir. R. 47.4(a)(3).
Provide the full names of all entities represented by undersigned counsel in this case.	Provide the full names of all real parties in interest for the entities. Do not list the real parties if they are the same as the entities. <input checked="" type="checkbox"/> None/Not Applicable	Provide the full names of all parent corporations for the entities and all publicly held companies that own 10% or more stock in the entities. <input checked="" type="checkbox"/> None/Not Applicable
Roku, Inc.		

☐ Additional pages attached

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4. Legal Representatives. List all law firms, partners, and associates that (a) appeared for the entities in the originating court or agency or (b) are expected to appear in this court for the entities. Do not include those who have already entered an appearance in this court. Fed. Cir. R. 47.4(a)(4).

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Franklin M. Smith, Dickinson Wright PLLC	Steven R. Daniels, Dickinson Wright PLLC	Craig Y. Allison, Dickinson Wright PLLC
Evi S. Li, Dickinson Wright PLLC	Caleb Green, Dickinson Wright PLLC	Dino Hadzibegovic, Dickinson Wright PLLC
Rebecca A. Tie, Dickinson Wright PLLC	Chad E. Eimers, Dickinson Wright PLLC	Mark H. Rogge, Dickinson Wright PLLC

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In re reexam of U.S. Patent No. 10,593,196 to Arling	90/019,073	PTO

6. Organizational Victims and Bankruptcy Cases. Provide any information required under Fed. R. App. P. 26.1(b) (organizational victims in criminal cases) and 26.1(c) (bankruptcy case debtors and trustees). Fed. Cir. R. 47.4(a)(6).

☒ None/Not Applicable ☐ Additional pages attached

Certificate of Interest - Additional Page

4. Legal Representatives, continued:

Kenneth J. Dyer, Dickinson Wright PLLC		
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TABLE OF ABBREVIATIONS

Abbreviation	Meaning
'196 patent	U.S. Patent No. 10,593,196 [Appx648-674]
FID	Final Initial Determination (July 9, 2021) [Appx47-586]
Opinion	Commission Opinion (Nov. 10, 2021) [Appx1-46]
Standing Opinion	Commission Opinion on Standing (Mar. 3, 2021) [Appx26168-26190]
2004 Barnett Agreement	Confidentiality & Invention Ownership Agreement between UEI and Mr. Brian Barnett [Appx50123]
Roku	Roku, Inc.
UEI	Universal Electronics, Inc.
Commission	U.S. International Trade Commission
ALJ	Administrative Law Judge
Section 337	19 U.S.C. § 1337
Subsection (B)	19 U.S.C. § 1337(a)(3)(B)
Subsection (C)	19 U.S.C. § 1337(a)(3)(C)
HDMI	High-Definition Multimedia Interface
POSA	Person of Ordinary Skill in the Art
Chardon	U.S. Pub. Patent Appl. No. 2012/0249890 [Appx46450-46470]
Mishra	U.S. Pub. Patent Appl. No. 2001/0005197 [Appx50100-50112]

STATEMENT WITH RESPECT TO ORAL ARGUMENT

Pursuant to Federal Rule of Appellate Procedure 34(a), Appellant Roku, Inc. (“Roku”) respectfully requests oral argument in this matter. This matter meets the standards of Rule 34(a)(2) for oral argument, and Roku believes that oral argument would significantly aid the Court’s decisional process.

STATEMENT OF RELATED CASES

Pursuant to Fed. Cir. R. 47.5, Appellant states that under subsection (a), an appeal in or from the same proceeding in the lower tribunal was previously pending before this appellate Court: *Universal Electronics, Inc. v. ITC*, Case No. 2022-1352. This Court granted Universal Electronics, Inc.’s (“UEI”) unopposed motion to voluntarily dismiss that appeal on February 16, 2022. *Universal Electronics, Inc. v. ITC*, Case No. 2022-1352, ECF No. 18 (Feb. 16, 2022).

One matter currently pending before the United States District Court for the Central District of California, *Universal Electronics, Inc. v. Roku, Inc.*, No. 8:20-cv-00701, may be directly affected by this Court’s decision in the pending appeal. That case is currently stayed.

Additionally, there is an *ex parte* reexamination proceeding, *In re reexam of U.S. Patent No. 10,593,196 to Arling*, Reexam Control No. 90/019,073, currently pending before the U.S. Patent and Trademark Office that may be directly affected by this Court’s decision in the pending appeal.

STATEMENT OF JURISDICTION

This is an appeal brought under 19 U.S.C. § 1337(c) from a final determination of the U.S. International Trade Commission with respect to Investigation No. 337-TA-1200. This Court has jurisdiction under 19 U.S.C. § 1337(c) and 28 U.S.C. § 1295(a)(6). On November 10, 2021, the Commission issued its Opinion, Limited Exclusion Order, Cease and Desist Order, and Termination of Investigation No. 337-TA-1200. The period for presidential review expired on January 10, 2022. Appellant filed this appeal on January 19, 2022.

STATEMENT OF THE ISSUES¹

1. Whether the Commission erred in finding that UEI has standing to assert the '196 patent.

2. Whether a domestic industry analysis under Section 337(a)(3)(C) requires a complainant to (a) allocate its expenditures to “articles protected by the patent,” and (b) offer evidence of the “substantiality” of its expenditures “with respect to the *articles* protected by the patent.”

3. Whether the Commission erred in determining that the asserted claims of the '196 patent are not invalid for obviousness.

STATEMENT OF THE CASE

A. Introduction

This appeal arises from a Section 337 investigation UEI requested on April 16, 2020. UEI alleged that Roku and certain television manufacturers violated Section 337 by importing televisions, set top boxes, remote control devices, streaming devices, and soundbars that infringe UEI's patents.

B. The Parties

Roku, Inc. is a corporation organized under the laws of Delaware that pioneered streaming to the TV, and is the leading TV streaming platform in the United States by hours streamed. Central to Roku's platform is the Roku operating

¹ All emphasis and annotations added unless otherwise noted.

system (“Roku OS”) that is designed to run on a variety of electronic devices. Roku OS also powers Roku TV models that are manufactured and sold by Roku’s TV brand partners who license the Roku OS and leverage Roku’s smart TV hardware reference designs. Roku TV models and Roku streaming players enable consumers to access a wide selection of content by connecting their Roku device to Roku’s streaming platform via a home broadband network.

The patent owner and complainant below, UEI, is based in Scottsdale, Arizona. Relevant to this appeal, UEI developed and sells QuickSet, which is a software platform related to universal remote control technology.

C. The Proceedings Below

In the underlying investigation, UEI’s complaint alleged that Roku and Roku’s TV brand partners collectively infringed six UEI patents, including the ’196 patent. UEI withdrew its allegations as to three of the patents in advance of the April 2021 evidentiary hearing—including the allegations against Roku’s TV brand partners, leaving Roku as the only remaining respondent in the investigation. After the hearing, the ALJ issued a FID finding the asserted claims of U.S. Patent Nos. 7,589,642 and 10,600,317 (the “’642 and ’317 patents”) invalid, which the Commission did not review (and therefore became final). The ALJ further found that Roku violated Section 337 with respect to the ’196 patent, a determination the Commission subsequently affirmed. Both UEI and Roku sought appeals to this

Court. After Roku moved to dismiss UEI's appeal of the invalidity findings on the '642 and '317 patents as untimely, UEI voluntarily dismissed its appeal. Thus, only the '196 patent remains at issue.

The '196 patent is a utility patent directed to "methods for appliance control via use of . . . a remote control," and is entitled "System and Method for Optimized Appliance Control." Appx649, Appx666 (1:66-2:6). With respect to the '196 patent, the ALJ found (1) that certain Roku products² infringe claims 1, 3, 11, 13-15 of the '196 patent; (2) UEI satisfied the domestic industry requirement with respect to the '196 patent under subsections (B) and (C); (3) that UEI has standing to assert the '196 patent; and (4) that, while Roku presented a *prima facie* case of obviousness, the infringed claims were valid in view of purported evidence of objective indicia of non-obviousness. Appx191.

Roku and UEI both petitioned for review of the FID, and on September 9, 2021, the Commission determined to "review all issues relating to the '196 patent" and requested additional briefing on questions related to validity and domestic industry. Appx27643-27644. On November 10, the Commission issued its Final Determination Finding a Violation of Section 337; its Opinion; a Limited Exclusion Order; and a Cease and Desist Order. Appx3. The Commission affirmed the ALJ's

² The ALJ found that certain revised Roku products do not infringe the '196 patent, and the Commission affirmed this finding. Appx16 (n.7). The revised products are not at issue in this appeal.

determination that Roku violated Section 337 with respect to the '196 patent by importing certain products. *Id.* The Commission issued a limited exclusion order and cease and desist order, but found that no bond was required. *Id.*

Relevant to this appeal, the Commission found that UEI has standing to assert the '196 patent. Appx10 (adopting the ALJ's findings as to standing). Further, the Commission affirmed the ALJ's finding that UEI satisfied the economic prong of the domestic industry requirement based on UEI's expenditures related to software ultimately used by the actual articles—Samsung televisions—found to practice the '196 patent. Appx36-37. However, the Commission found that UEI satisfied the domestic industry requirement under only subsection (C)—it “took no position” on the ALJ's finding that UEI satisfied the domestic industry requirement under subsection (B).³ *Id.* Finally, the Commission also reversed the ALJ's finding that Roku presented a *prima facie* case of obviousness, and further found that even if Roku had done so, UEI presented sufficient evidence of secondary considerations to render the challenged claims non-obvious.⁴ Appx29-31.

³ When the Commission takes “no position” on an issue, the Commission essentially vacates the ALJ's finding, and the issue is not appealable to this Court. *See Beloit Corp. v. Valmet Oy*, 742 F.2d 1421, 1422-23 (Fed. Cir. 1984).

⁴ The Commission found a violation with respect to claims 1, 3, 11, and 13-15, but its finding of non-obviousness rested solely on its analysis of claim 1—the only independent claim at issue. Appx29-31. The Commission did not disturb the ALJ's findings that the prior art references at issue would have rendered dependent claims 3, 11, and 13-15 obvious but for the findings with respect to claim 1. Appx21,

On January 19, 2022, Roku filed its petition for review and appeal. This appeal focuses on the Commission’s erroneous findings that (1) UEI has standing to assert the ’196 patent; (2) UEI satisfied the economic prong of the domestic industry requirement; and (3) the asserted claims of the ’196 patent are not invalid.

D. UEI’s Correction of Inventorship and Post-Complaint Assignment of the ’196 Patent

Mr. Barnett is a UEI employee and named inventor of the ’196 patent. Appx50123; Appx676. However, Mr. Barnett was not originally named as an inventor. Appx649. In September 2020—five months after UEI filed the complaint in this Investigation—UEI filed a petition for correction of inventorship to name Mr. Barnett as an inventor of the patent. Appx50113-50122. Contemporaneous with the petition for correction, Mr. Barnett executed an assignment transferring his rights in the ’196 patent to UEI. Appx21594-21601.

Once the Patent Office corrected the inventorship, Roku filed a motion for summary determination, arguing that UEI lacks standing to assert the ’196 patent because, at the time UEI filed the complaint and for months thereafter, Mr. Barnett had not yet assigned his rights in the ’196 patent to UEI and accordingly UEI lacked all substantial rights in the ’196 patent. Appx21499-21526. UEI opposed the motion on two grounds. Appx23303-23329. The first ground was that Mr. Barnett allegedly

Appx31; Appx171-173 (“The additional features of the various dependent claims are all disclosed in either Chardon or Mishra.”).

conveyed his rights to the '196 patent through an agreement that Mr. Barnett had signed in 2004—*i.e.*, the 2004 Barnett Agreement.⁵ Appx23316-23320. The second ground was that Mr. Barnett allegedly conveyed his rights through his prior assignment of certain rights in three related patent applications, of which the '196 patent is a continuation-in-part. Appx23320-23326.

The ALJ granted summary determination, finding UEI lacks standing to assert the '196 patent. Appx25576. For UEI's first ground, the ALJ found that the 2004 Barnett Agreement contained a "mere promise to assign rights in the future, not an immediate transfer of expectant interests" and therefore "did not automatically assign Mr. Barnett's rights to the 196 Patent to UEI." Appx25572 (citing *Omni Medsci, Inc. v. Apple Inc.*, No. 19-cv-05924, 2019 WL 9834334 (N.D. Cal. Nov. 25, 2019); *Arachnid, Inc. v. Merit Indus.*, 939 F.2d 1574, 1581 (Fed. Cir. 1991)). For UEI's second ground, the ALJ found that "[b]ecause the 196 Patent derived from a continuation-in-part application, and because the previous executed assignments were only for 'divisions and continuations,' the three previous assignments do not give UEI ownership of the 196 Patent." Appx25574 (quoting Appx21892, Appx21964, Appx21990).

⁵ The '196 patent has an alleged date of invention after the date of the 2004 Barnett Agreement. Appx649-650 (claiming priority to a provisional application filed October 28, 2011).

UEI petitioned the Commission to review the standing issue, and the Commission reversed, basing its entire analysis on UEI's second ground. The Commission found that Roku did not carry its burden to show that it was "entitled to summary determination as a matter of law" that UEI lacked standing. Appx26168. The Commission did not analyze UEI's first ground for standing—whether the 2004 Barnett Agreement transferred Mr. Barnett's rights to UEI. Appx26180 ("Because the issue is moot in light of the 2012 Barnett Assignments, the Commission takes no position on the dispute as to the 2004 Barnett Agreement.").

The parties proceeded to the evidentiary hearing on the '196 patent. UEI moved *in limine* to preclude Roku from arguing that Mr. Barnett's assignments failed to convey the '196 patent to UEI before UEI filed the present complaint, contending that the standing issue was "decided against Roku as a matter of law by the Commission and is no longer subject to argument." Appx28158-28159. The ALJ denied the motion, explaining that "the only issue actually decided by the Commission is that Roku did not meet its burden on summary determination." Appx28160. The ALJ also found that the Commission Opinion "did not find as a matter of law that Mr. Barnett's assignments conveyed his rights to the 196 Patent to UEI and did not find that UEI has standing to assert the 196 Patent." Appx28159.

At the hearing, Mr. Barnett testified regarding his purported understanding of the 2004 Barnett Agreement—specifically, that UEI would immediately own

inventions he conceived while an employee at UEI. Appx40008 (30:21-24). He also testified that “it was always my understanding that I had no ownership of the [’196] patent from my start of employment.” Appx400019 (74:1-5). In the FID, the ALJ relied on this testimony and stated that “Roku did not present evidence to the contrary, or indeed, any new evidence at all.” Appx141. The ALJ found—based only on the Barnett 2004 Agreement and Barnett’s testimony relating thereto—that UEI has standing to assert the ’196 patent. *Id.* The ALJ did not make *any* factual findings for UEI’s second ground, regarding the assignments in the priority applications. Appx139-141. Roku petitioned the Commission to review the standing issue, but the Commission affirmed the ALJ’s decision on standing without analysis. Appx10 (“The Commission adopts the ID’s findings as to the ’196 patent not addressed below, including the ID’s finding that UEI has standing to assert the ’196 patent (Appx139-141).”). Consequently, in the Commission’s Final Determination, the only basis for the Commission’s finding of standing is the 2004 Barnett Agreement, and that basis is the subject of this appeal.

E. QuickSet and The Domestic Industry Products

To satisfy the Commission’s domestic industry requirement, UEI relied on its QuickSet software, which enables control of various types of devices throughout the home. Appx8. But because QuickSet alone does not practice all of the claim limitations of the ’196 patent, UEI did not and could rely upon QuickSet as an

“article protected by” the ’196 patent. 19 U.S.C. § 1337(a)(3). Instead, UEI claimed that the articles “protected by” the ’196 patent were certain televisions made by a third party, Samsung. Appx8.

But to show “significant” or “substantial” domestic investments in a protected article—also called the “economic prong” of the domestic industry requirement—UEI did not rely upon expenditures directly related to the Samsung televisions. Instead, UEI relied solely upon its own expenditures related to: (1) the QuickSet software development kit (“QuickSet SDK”) that is ultimately supplied to Samsung, as well as other customers not at issue here; (2) UEI’s cloud-based QuickSet service (“QuickSet Cloud”); (3) UEI’s efforts to implement QuickSet software on the Samsung televisions; and (4) the number of UEI employees that purportedly work on the QuickSet software as a whole. Appx42000-42005; Appx40065 (258:24-259:15); Appx187-190. For subsection (B)—labor and capital investments—UEI attempted to allocate its expenditures to the Samsung televisions. Appx183-184. On the other hand, for subsection (C)—engineering and research and development—UEI did not allocate any expenditures to the Samsung televisions, asserting that “there is no need to allocate the engineering and R&D investments [under subsection (C)] in the QuickSet Platform to the Samsung DI Products (e.g. Samsung TVs).” Appx26880; Appx187-188.

In his Initial Determination, the ALJ found that UEI satisfied the economic prong of the domestic industry requirement for the '196 patent through both subsections (B) and (C). Appx183-190. Roku petitioned the Commission to review both of these findings. Appx27368-27369. The Commission “determined to review all issues relating to the '196 patent,” including the ALJ’s domestic industry findings. Appx27643. On review, the Commission took no position on whether UEI satisfied the economic prong under subsection (B), and it “determined not to review and thus adopted the ID’s findings that UEI satisfied the economic prong of the domestic industry requirement with respect to [the '196 patent] under Section 337(a)(3)(C).” Appx36-37. Accordingly, the only domestic industry issue supporting the Commission’s finding of a violation of Section 337 (and thus the only domestic industry issue on appeal) is whether UEI satisfied subsection (C). *See Beloit Corp.*, 742 F.2d at 1422-23.

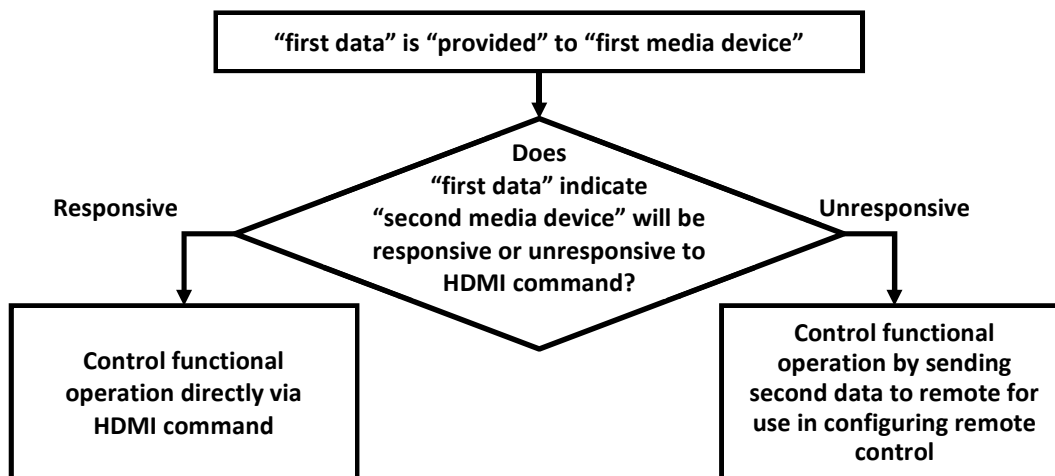
F. The Technology of the '196 Patent

The '196 patent is directed to improving the remote control of consumer electronics devices in a home entertainment system. Appx649, Appx666 (1:41-53, 1:66-2:6). In particular, it is concerned with enabling a remote control to reliably control such devices given the proliferation of devices using different communication protocols. Appx666 (1:41-62). The '196 patent uses software—dubbed a “Universal Control Engine (UCE)”—to identify the appropriate

communication protocol for controlling each device. Appx649, Appx666 (2:2-45); Appx10 (citing Appx653 (Fig. 2), Appx667-668 (4:39-44, 6:62-7:4)).

Each claim of the '196 patent depends from claim 1. In short, claim 1 recites that if “first data” indicates that the second media device will be responsive to a command to control a functional operation sent via HDMI,⁶ then the first media device will send the command directly to the second media device via its HDMI port. Appx674 (cl. 1); Appx11-12. On the other hand, if the “first data” indicates that the second media device will be unresponsive to a command sent via HDMI, then the first media device will instead send second data to a remote control to configure the remote to control that functional operation. Appx674 (cl. 1); Appx11-12. The decision logic of claim 1 of the '196 patent can be seen in the following demonstrative flowchart:

⁶ HDMI refers to the High-Definition Multimedia Interface Specification, which is an interface and cable for transmitting audiovisual signals among various devices in a home entertainment system. Appx46519, Appx46525-46526; Appx40276-40277 (879:16-880:6); Appx162. HDMI includes a “CEC” line—referred to as HDMI-CEC—which is used for control and status information, higher level control functions, and setup tasks, and includes operands indicating a user has pressed a particular button on a remote control which may be forwarded from the device receiving the remote control signal to a connected device via CEC. Appx46693, Appx46713, Appx46719-46720, Appx46724-46725, Appx46776; Appx40278 (884:17-22).



Appx55145; Appx11-12. Claim 1 does not specify how the remote will control the functional operation, but the written description explains that the Universal Control Engine may “delegate[]” control of Infrared (IR) transmissions to the “remote control” and thereby use it “as a relay device for those commands determined to be best executed via IR transmissions.” Appx667 (4:46-50).

G. The Asserted Prior Art References

Before the Commission, Roku relied on a combination of two prior art references: U.S. Pub. Patent Appl. No. 2012/0249890 (“Chardon”) and U.S. Pub. Patent Appl. No. 2001/0005197 (“Mishra”) to show that the asserted claims would have been obvious. Just like the ’196 patent, Chardon’s system is designed to address the complexity of remotely controlling the increasing variety of consumer electronic devices in a home entertainment system, which use an increasing number of different communication protocols, including HDMI-CEC. Appx46458 (¶¶ 1-5); Appx40275 (875:13-18). As Chardon notes, the introduction of HDMI-CEC

introduced both additional functionalities and additional problems in implementing remote control of HDMI appliances. Appx46458 (¶¶ 1-5). Because HDMI-CEC may not always work with all devices, Chardon discloses using IR codes to control a device when HDMI-CEC control does not work. Appx46463-46465 (¶¶ 58-62).

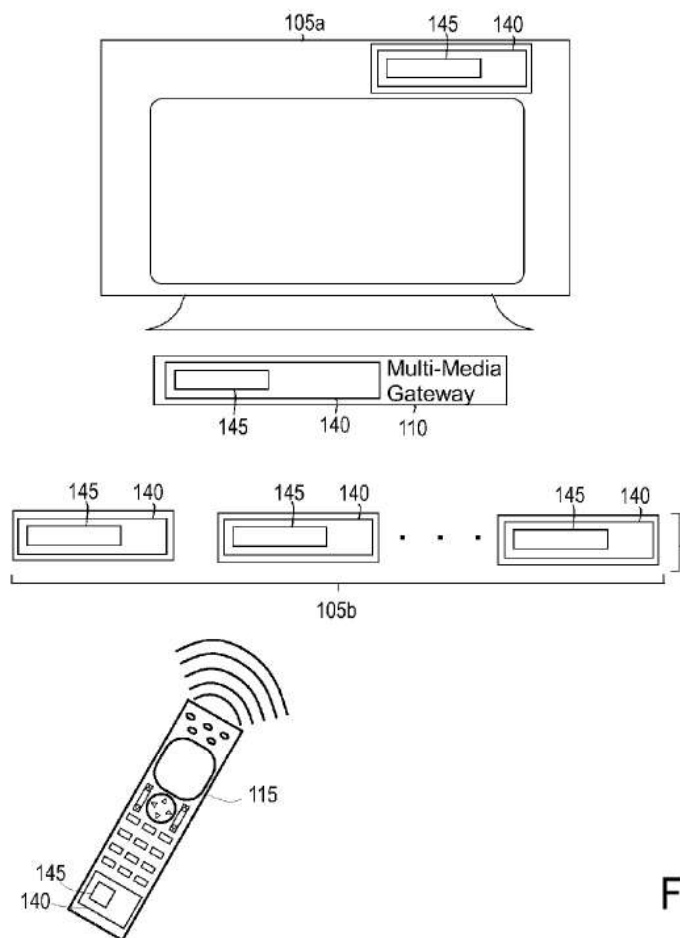


FIG. 1

Chardon's entertainment system 100 includes various HDMI appliances 105 (e.g., HDMI display 105a and HDMI sources 105b), a multi-media gateway 110, and remote control device 115. Appx46460 (¶¶ 29-31), Appx46451. As shown above in Figure 1, the "remote control system 140" and "remote control engine 145,"

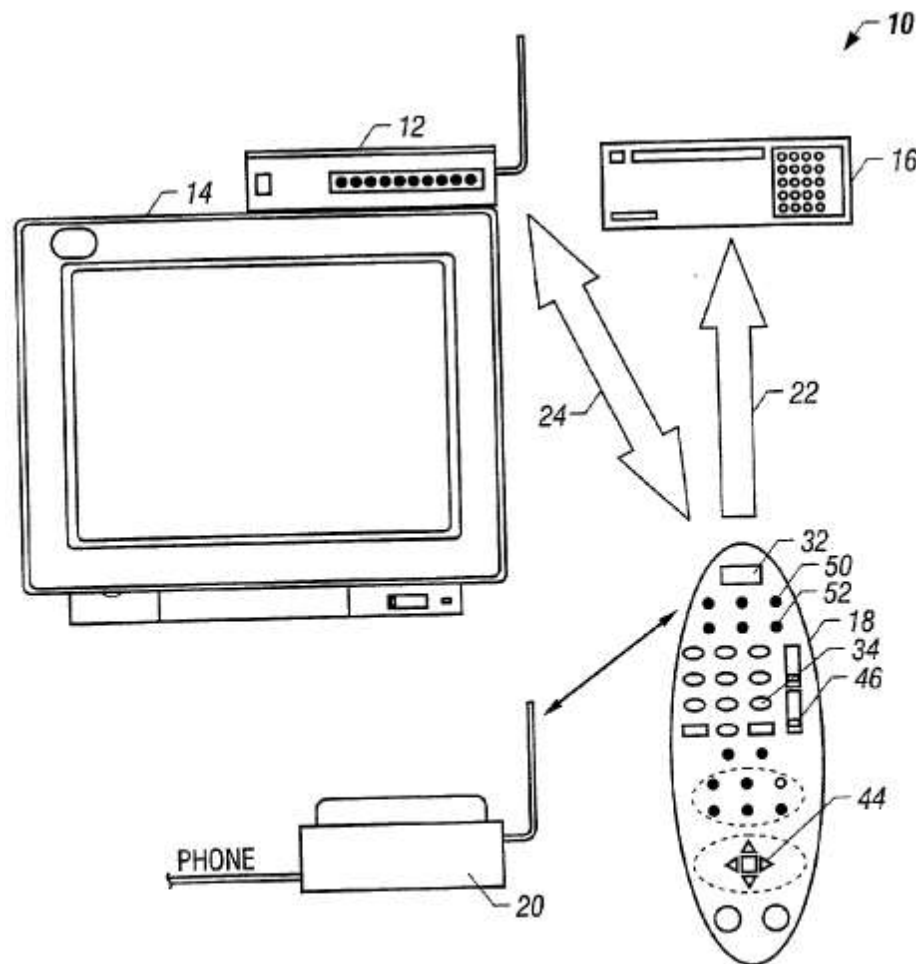
can be located within each of the multi-media gateway, the remote control device, and the other HDMI devices. *Id.*; Appx46458 (¶ 6), Appx46460-46462 (¶¶ 36, 38-41, 43, 45); Appx40276 (876:23-877:1). The remote control engine is software that selects the command code for controlling a particular functional operation of a target device, including choosing between IR and CEC control. Appx46459-46461 (¶¶ 16, 26-27, 39-40), Appx46469 (¶ 88); Appx40280 (892:7-895:1).

Chardon discloses various methods for choosing between sending IR and CEC codes to control a target device. In one method, Chardon's system attempts CEC control, and if no response is received, the system switches to using IR control instead. Appx160-161 (citing Appx46459 (¶ 12), Appx46463-46464 (¶ 58), Appx46455 (elements 510-530); Appx40281 (896:3-25)). In particular, the "remote control system" may "monitor[] the CEC bus for a response issued from the second HDMI appliance in response to receipt and execution of [a] CEC command code" and "if a response is not issued from the second HDMI appliance . . . i) determin[e] an IR command code that corresponds to the CEC command code for the second HDMI appliance, and ii) transmit[] the IR command code to the second HDMI appliance to perform a function associated with the CEC command code." Appx46459 (¶ 12). The remote control system stores the success or failure of CEC commands and associates the target device with CEC or IR codes for use in future attempts to control the same operation of that device. Appx161; Appx46450

(Abstract), Appx46459-46460 (¶¶ 14, 20, 33-34), Appx46463-46464 (¶¶ 58-59), Appx46466 (¶ 68); Appx40281-40282 (898:21-901:11). Thus, Chardon's system repeatedly tests whether CEC control worked, and if not, it records that failure and falls back to using IR control instead.

As Roku argued before the Commission, Chardon discloses each limitation of claim 1 of the '196 patent other than "transmitting second data to a remote control device, via use of the transmitter, for use in configuring the remote control device to transmit a second command directly to the second media device." Appx27720-21; Appx27036-27046. In particular, rather than using a remote control to send IR commands, Chardon's system uses an IR blaster that is built into the multimedia gateway itself to send the IR commands. Appx27033 (citing Appx46455 (element 540), Appx46456 (element 630), Appx46458 (¶¶ 2-3), Appx46461 (¶ 40), Appx46463-46466 (¶¶ 58, 60-61, 68, 70); Appx40320-40321 (940:18-25, 944:25-946:6)).

However, Roku argued that a second reference, Mishra, discloses the well-known technique of relaying IR codes through a remote control. Like Chardon, Mishra addresses the problems of controlling devices in a home entertainment system, and, in particular, the same issue of too many devices having remote controls with incompatible remote control codes. Appx50108 (¶¶ 2, 4-5); Appx40265 (833:12-835:22).

**FIG. 1**

Mishra's set-top system 12 stores a variety of infrared key codes. Appx50109 (¶ 20). The RCU transmits a signal identifying a pressed button, and in response, system 12 sends a key code back to the RCU 18 (via path 24). Appx50110 (¶¶ 37, 39). The remote then outputs the code in an IR signal to the target device via path 22. *Id.*; Appx40266 (837:25-838:13). In an alternative embodiment, the RCU “contain[s] sufficient memory that the master may send the RCU both the protocols and the necessary codes to control the devices” which are then “save[d]” in the

RCU’s “local memory.” Appx50110 (¶ 38). Thus, the RCU is fed “the information needed to do all the different controls for a given device initially” and then “handles those protocols on its own.” *Id.* (¶ 39).

As Roku argued to the Commission, although Chardon does not disclose sending data to the remote control to cause it to issue IR codes, relaying IR codes through a remote control was a well-known alternative to IR blasters, and had known benefits over IR blasters. Appx27032-27033; Appx40265 (832:16-833:2), Appx40321 (945:7-18); Appx55009; Appx46473, Appx46478 (6:40-53); Appx50110 (¶¶ 37, 39). For example, it was known that IR blasters can be difficult and time-consuming to set-up by the user and constrain how the user can arrange the devices in their home theater. Appx40320 (940:18-941:7). Thus, a POSA would have been motivated to turn to a reference that provides details for controlling devices by relaying IR codes through a remote control. *Id.* (941:19-942:24). Mishra provides exactly those details. Appx50109-50110 (¶¶ 20, 37, 39), Appx50101; Appx40319-40320 (938:10-940:4). Notably, both Chardon and Mishra are directed to improving the remote control of home entertainment devices that use different control protocols through the assistance of an intermediary devices (*e.g.*, Chardon’s remote control engine and Mishra’s System 12). Appx50108 (¶¶ 2-5); Appx46458 (¶¶ 1-3); Appx40265-40266 (835:1-22, 838:2-13), Appx40275 (875:13-18), Appx40319-40320 (938:25-939:5), Appx40326 (965:3-15). Thus, a POSA would

have been motivated to modify Chardon's system to use Mishra's technique of relaying IR codes through the remote control—instead of Chardon's use of IR blasters in the multi-media gateway—as that would be a simple and predictable substitution of one known element for another. Appx40320 (942:4-24).

SUMMARY OF THE ARGUMENT

The Commission correctly determined that the '642 and '317 patents were invalid, and that Roku's products running the redesigned version of the Roku OS software did not infringe the '196 patent. But the Commission nonetheless found a violation of Section 337 and issued exclusion and cease and desist orders covering articles that infringe claims 1, 3, 11, and 13-15 of the '196 patent. In doing so, the Commission committed reversible error in three distinct areas: standing, domestic industry, and obviousness. These errors each independently merit reversal.

First, the Commission's determination that UEI had standing to assert the '196 patent based on Mr. Barnett's 2004 agreement with UEI and his decades-later interpretation of the agreement is contrary to law—specifically, this Court's holdings in *Omni MedSci, Inc. v. Apple Inc.*, 7 F.4th 1148, 1152 (Fed. Cir. 2021) and *Arachnid, Inc. v. Merit Industries*, 939 F.2d 1574 (Fed. Cir. 1991). There is no dispute that the first time Mr. Barnett executed an express assignment of the '196 patent was well after the complaint was filed, and that this assignment alone would be insufficient to confer standing on UEI. But UEI argued—and the Commission

ultimately agreed—that certain language in the 2004 agreement between Mr. Barnett and UEI effected a then-present conveyance of Mr. Barnett’s rights in all his future inventions, including the ’196 patent. Appx10; Appx141. The agreement, however, includes a quintessential example of a promise to do something *in the future*—Mr. Barnett agreed that his inventions made during his employment with UEI “*shall be* the property of” UEI. Appx26179. The agreement’s “shall be” language indicates that the invention(s) subject to this provision of the agreement *would eventually* become property of UEI, but it does not contemplate precisely when or how this would occur. *Omni MedSci*, 7 F.4th at 1152 (employee’s “shall be” promise is merely a “promise to assign in the future”); *Arachnid*, 939 F.2d at 1580-81 (consulting agreement with “shall be” language was an agreement to assign, not an assignment). Indeed, consistent with this language, Mr. Barnett entered into many different assignment agreements with UEI over the years, including the belated ’196 patent assignment. Appx40019 (75:16-22). The Commission legally erred in relying on Mr. Barnett’s after-the-fact trial testimony to override the plain language of his agreement and this course of conduct.

Second, the Commission ignored the requirements of its governing statute, as well as this Court’s precedent, in finding that UEI satisfied the domestic industry requirement. Section 337 requires that a domestic industry must exist “with respect to articles protected by the patent.” 19 U.S.C. § 1337(a)(3). In *Lelo Inc. v. ITC*, this

Court explained that Section 337’s plain text requires a “quantitative analysis” of the “relative importance” of the complainant’s proffered domestic industry investments *to the patent-practicing articles*. 786 F.3d 879, 883-84 (Fed. Cir. 2015). But here, UEI did nothing of the sort. The patent-practicing articles at issue are complex, expensive televisions—which are made not in the United States by UEI, but manufactured abroad by a third party, Samsung. UEI, on the other hand, submitted and relied upon evidence only of its own R&D and engineering investments in its QuickSet software, a minor component sold to Samsung and other customers. But UEI did not allocate its relied-upon QuickSet expenses to ensure that only investments made “with respect to” *Samsung televisions* were appropriately counted as domestic industry expenses. And UEI also did not present evidence of what *other* investments were made, either by itself, Samsung, or others, in the protected articles (the Samsung televisions)—evidence required to “determine whether there is a ‘significant’ increase or attribution by virtue of [UEI’s] asserted commercial activity in the United States.” *Lelo*, 786 F.3d at 883. The Commission’s acceptance of UEI’s domestic industry investments without requiring appropriate quantification violates Section 337’s plain requirements that the investments be both “substantial” and “with respect to” the patent-protected articles.

Finally, the Commission erred in its obviousness analysis, committing clear errors of both law and fact in finding that Roku failed to carry its burden to show

obviousness and that secondary considerations outweighed any *prima facie* showing. In doing so, the Commission ignored the “expansive and flexible” approach for obviousness required under *KSR*, and instead rejected each of the prior art references for not *individually* teaching the entirety of certain limitations, and for not reciting an express teaching, suggestion, or motivation to combine. *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 415, 419 (2007). When viewed in light of the appropriate legal standard, the evidence shows that Roku carried its obviousness burden. Indeed, the undisputed evidence showed that Chardon discloses all of the claim limitations other than sending data to configure a remote control, and that this last limitation merely reflects the well-known technique of relaying IR codes through a remote control as disclosed in Mishra, which a POSA would have been motivated to substitute in place of Chardon’s IR blasters. Regarding secondary considerations—an alleged long-felt need, widespread adoption, and industry praise of Samsung televisions running UEI’s QuickSet software—the Commission legally erred by finding a nexus between the alleged secondary considerations and the ’196 patent without first making the requisite determination that the Samsung televisions are “coextensive” with the ’196 patent’s claims, and without any finding that the secondary considerations were driven by the *novel* limitations of the claims. *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1374 (Fed. Cir. 2019); *Asyst Techs., Inc. v. Emtrak, Inc.*, 544 F.3d 1310, 1316 (Fed. Cir. 2008). As described below,

because the '196 patent covers at most a small portion of the QuickSet software, which is itself just a small component of the Samsung televisions, there is no evidence—let alone substantial evidence—supporting the Commission’s conclusion on nexus.

ARGUMENT

I. Standard of Review

This Court reviews a final determination of the Commission in accordance with Chapter 7 of the Administrative Procedure Act (APA), 5 U.S.C. §§ 701-706. *See* 19 U.S.C. § 1337(c). Accordingly, this Court reviews factual findings of the Commission under the “substantial evidence” standard. *Enercon GmbH v. ITC*, 151 F.3d 1376, 1381 (Fed. Cir. 1998) (citing *Checkpoint Sys., Inc. v. ITC*, 54 F.3d 756, 759 (Fed. Cir. 1995)). In addition, this Court reviews the Commission’s factual determination of whether the various jurisdictional provisions of the statute have been met to determine if they are supported by substantial evidence. *Enercon*, 151 F.3d at 1381. Further, this Court reviews “questions of law, as interpreted and applied by the ITC, *de novo*.” *Lelo*, 786 F.3d at 883.

This Court reviews the question of standing to assert a patent claim *de novo*. *SiRF Tech., Inc. v. ITC*, 601 F.3d 1319, 1325 (Fed. Cir. 2010); *Rite-Hite Corp. v. Kelley Co.*, 56 F.3d 1538, 1551 (Fed. Cir. 1995). This Court reviews for substantial evidence underlying factual determinations upon which a conclusion of standing is

based. *SiRF*, 601 F.3d at 1325; *see also Finnigan Corp. v. ITC*, 180 F.3d 1354, 1361-62 (Fed. Cir. 1999).

As the agency charged with the administration of Section 337, the Commission is entitled to appropriate deference to its interpretation of the statute. *See Chevron U.S.A., Inc. v. Nat'l Res. Def. Council, Inc.*, 467 U.S. 837, 844 (1984); *Suprema, Inc. v. ITC*, 796 F.3d 1338, 1345-46 (Fed. Cir. 2015). Under *Chevron*, this Court must determine “whether Congress has directly spoken to the precise question at issue.” *Chevron*, 467 U.S. at 842. “If the intent of Congress is clear, that is the end of the matter; for the court, as well as the agency, must give effect to the unambiguously expressed intent of Congress.” *Id.* at 842-43 (footnote omitted). This Court will therefore uphold the Commission’s interpretation of Section 337 if it is reasonable in light of the language, policies and legislative history of the statute. *See Corning Glass Works v. ITC*, 799 F.2d 1559, 1565 (Fed. Cir. 1986).

Obviousness is a legal question based on underlying fact findings. *Purdue Pharma L.P. v. Epic Pharma, LLC*, 811 F.3d 1345, 1351 (Fed. Cir. 2016). This Court reviews legal determinations *de novo* and underlying factual determinations for substantial evidence. *Rambus Inc. v. Rea*, 731 F.3d 1248, 1251 (Fed. Cir. 2013).

II. UEI Lacks Standing to Assert the '196 Patent

A. Legal Standard

It is well-settled law that “[w]here one co-owner possesses an undivided part of the entire patent, that joint owner must join all the other co-owners to establish standing.” *Israel Bio-Eng’g Project v. Amgen Inc.*, 475 F.3d 1256, 1264 (Fed. Cir. 2007). If all patent co-owners are not joined, the complainant(s) do not have standing to assert the patent. *See, e.g., STC.UNM v. Intel Corp.*, 754 F.3d 940, 947 (Fed. Cir. 2014) (affirming the district court’s dismissal for lack of standing where not all co-owners consented to join suit). “This rule applies equally in ITC investigations.” *SiRF*, 601 F.3d at 1326.

Standing is a jurisdictional issue that may be raised at any time and the burden always remains on the complainant. *See, e.g., Abbott Point of Care Inc. v. Epocal, Inc.*, 666 F.3d 1299, 1302 (Fed. Cir. 2012) (explaining that the patentee has “the burden to show necessary ownership rights to support standing to sue”); *Sicom Sys., Ltd. v. Agilent Techs., Inc.*, 427 F.3d 971, 976 (Fed. Cir. 2005) (“The party bringing the action bears the burden of establishing that it has standing.”); *see also Spokeo, Inc. v. Robins*, 578 U.S. 330, 338 (2016) (complainant bears burden of proof to show standing). This Court has clearly articulated that “the plaintiff must demonstrate that it held enforceable title to the patent at the inception of the lawsuit to assert standing”—if it lacks such standing, “the suit must be dismissed, and the

jurisdictional defect cannot be cured after the inception of the lawsuit.” *Abraxis Bioscience, Inc. v. Navinta LLC*, 625 F.3d 1359, 1364 (Fed. Cir. 2010) (citations and internal quotation marks omitted). That is, an assignment executed during the pendency of an investigation, even one with purported *nunc pro tunc* effect, cannot be used to cure a standing defect.

B. The 2004 Barnett Agreement Unambiguously Did Not Effect a Present Conveyance of Rights

This Court applies “federal law to determine whether the contract here created an automatic assignment or created an obligation to assign.” *Omni MedSci*, 7 F.4th at 1151; *DDB Techs., L.L.C. v. MLB Advanced Media, L.P.*, 517 F.3d 1284, 1290 (Fed. Cir. 2008) (treating as a matter of federal law “the question of whether a patent assignment clause creates an automatic assignment or merely an obligation to assign is intimately bound up with the question of standing in patent cases”). “Whether an assignment of patent rights in an agreement is automatic or merely a promise to assign depends on the contractual language itself. . . . [C]ontracts that obligate the owner to grant rights in the future do not vest legal title to the patents in the assignee.” *Abraxis*, 625 F.3d at 1364-65 (citations omitted). Indeed, an agreement to assign “reflects a mere promise to assign rights in the future, not an immediate transfer of expectant interests.” *Bd. of Trs. of Leland Stanford Jr. Univ. v. Roche Molecular Sys., Inc.*, 583 F.3d 832, 841 (Fed. Cir. 2009). Such a mere promise

requires the execution of a subsequent written instrument. *IpVenture, Inc. v. Prostar Comput., Inc.*, 503 F.3d 1324, 1327 (Fed. Cir. 2007).

The 2004 Barnett Agreement—the sole agreement relied upon by the Commission in the Final Determination to establish UEI’s standing—imposed nothing more than a mere obligation to assign patent rights in the future and did not effect a present conveyance of any patent rights. Instead, the 2004 Barnett Agreement merely states that Mr. Barnett “hereby agree[s]” that his inventions made during his employment “*shall be* the property of” UEI. Appx26179-26180. The agreement’s “shall be” language indicates that the invention(s) subject to this provision of the agreement *would* become property of UEI *in the future*, but it does not contemplate precisely when or how this would occur. Such language therefore indicates nothing more than a mere promise to assign to UEI Mr. Barnett’s inventions at some indeterminate point in the future. *Omni MedSci*, 7 F.4th at 1152 (an employee’s “shall be” promise is merely a “promise to assign in the future”).

In fact, when the ALJ granted summary determination that UEI lacked standing to assert the ’196 patent, the ALJ correctly found just that—the unambiguous language of the 2004 Barnett Agreement contained a “mere promise to assign rights in the future, not an immediate transfer of expectant interests” and therefore “did not automatically assign Mr. Barnett’s rights to the 196 Patent to UEI.” Appx25572.

Indeed, this Court recently found that nearly identical language was a mere promise to assign in the future, not evidence of a then-present assignment of rights. In *Omni MedSci*, this Court found that a bylaw's provision that "[p]atents and copyrights . . . supported directly or indirectly . . . by funds administered by the University . . . ***shall be the property of*** the University" is "most naturally read as a statement of intended disposition and a promise of a potential future assignment, not as a present automatic transfer." 7 F.4th at 1150, 1152 (emphasis in original) (bold added). In doing so, the Court saw "no meaningful difference" between the provision in the bylaws and a similar provision disputed in *Arachnid, Inc. v. Merit Industries*, 939 F.2d 1574 (Fed. Cir. 1991), where the Court found the operative language of "*shall be the property of* [Arachnid], and all rights thereto *will be assigned by* IDEA . . . to [Arachnid]" lacked a present-tense active verb to convey patent rights. 7 F.4th at 1153-54 (first emphasis added by *Omni MedSci* Court, second emphasis added by *Arachnid* Court). Here, the operative language in the 2004 Barnett Agreement is identical to the relevant language of the agreement at issue in *Omni MedSci*: "*shall be the property of*" the employer. Appx26179. Without additional present-tense verbs of conveyance, the 2004 Barnett Agreement

does not effect a present conveyance of patent rights. The Commission’s finding to the contrary is, therefore, incorrect as a matter of law.⁷

C. The ALJ and Commission Erred in Considering and Crediting Mr. Barnett’s Testimony

The Commission erred by adopting the ALJ’s decision that credited litigation-inspired, after-the-fact parol evidence contradicting the unambiguous 2004 Barnett Agreement. The ALJ improperly credited Mr. Barnett’s testimony at the hearing that he allegedly understood he never owned any rights in the ’196 patent. Appx10; Appx141 (“[I]t was always my understanding that I had no ownership of the [196] patent from the start of my employment.” (citing Appx40019 (74:1-5))). But the ALJ legally erred by considering this parol evidence, because the 2004 Barnett Agreement is unambiguous—“[a]bsent ambiguous provisions . . . there is no need to resort to parol evidence to determine the parties’ intent.” *Immunex Corp. v. Sandoz Inc.*, 964 F.3d 1049, 1060 (Fed. Cir. 2020). Indeed, the ALJ found this language to be unambiguous when he originally granted Roku’s motion for summary determination. Appx25572.

⁷ Any argument that the present tense language “hereby agree” is an express grant of the ’196 patent to UEI should be rejected—in context, that language merely indicates Mr. Barnett’s then-present agreement to be bound by the contract. *Omni MedSci*, 7 F.4th at 1152 (“Nor does it say that the inventor ‘agrees to grant and does hereby grant’ title to the patent—language that this court has previously held to constitute a present automatic assignment of a future interest.”) (citation omitted). And, as previously noted, *see supra* n.5, any alleged date of invention of the ’196 patent post-dates the 2004 Barnett Agreement.

The Commission should not have considered this testimony, which is irrelevant in view of the unambiguous language of the 2004 Barnett Agreement. *See Immunex*, 964 F.3d at 1060. In *Immunex*, this Court faulted the district court for determining the intent of the parties before analyzing whether the contract provisions at issue were ambiguous, because “there is no need to resort to parol evidence to determine the parties’ intent” when the provisions are not ambiguous. *Id.* at 1060-61. The Commission made the same error. Appx10; Appx141. The plain language of the 2004 Barnett Agreement shows that Mr. Barnett promised to assign his rights in the future—and “if the ‘provisions are clear and unambiguous, they must be given their plain and ordinary meaning.’” *McAbee Constr., Inc. v. United States*, 97 F.3d 1431, 1435 (Fed. Cir. 1996) (citation omitted). But the Commission, by adopting the FID, based its entire finding on one statement that Mr. Barnett understood that he “had no ownership of the [196] patent from the start of [his] employment.” Appx141 (citing Appx40019 (74:1-5)). The Commission erred by crediting any such testimony that contradicts the unambiguous 2004 Barnett Agreement and the ALJ’s prior finding that the agreement was unambiguous.⁸

⁸ Moreover, Mr. Barnett’s testimony is nonsensical and an improper lay opinion. It is black-letter law that initial ownership of a patent vests first in the inventor. *Beech Aircraft Corp. v. EDO Corp.*, 990 F.2d 1237, 1248 (Fed. Cir. 1993). Therefore, as a matter of law, Mr. Barnett must have owned the invention claimed by the ’196 patent.

And to the extent parol evidence should be considered, Mr. Barnett and UEI's course of dealing in the years since the 2004 Barnett Agreement directly contradicts Mr. Barnett's assertion that he believed he never owned the '196 patent or any other patent. Mr. Barnett acknowledged at the hearing that, well after the 2004 Barnett Agreement, he repeatedly executed assignment after assignment transferring patent rights to UEI, including the post-complaint assignment of the '196 patent. Appx40019 (75:16-22) (discussing the 2012 Barnett Assignments executed after 2004); Appx26179-26180. This longstanding post-2004 and pre-litigation conduct undermines both Mr. Barnett's testimony and UEI's litigation-inspired argument that it owned the '196 patent all along—especially considering that UEI corrected inventorship *during the course of the Investigation*. Accordingly, to the extent parol evidence is considered—and it should not be—substantial evidence does not support the Commission's decision because the longstanding course of dealing contradicts UEI's standing theory.

D. The Commission's Findings on Standing Rested on the 2004 Barnett Agreement Alone

To the extent UEI or the Commission may argue that this Court should nonetheless affirm the Commission based on an alleged conveyance of the '196 patent through assignments related to certain priority applications, the *Chenery* doctrine forecloses any such argument. It is a well-settled principle of administrative law that this Court cannot uphold an agency's decision on a ground not ruled on by

the agency. *See SEC v. Chenery Corp.*, 318 U.S. 80, 87 (1943) (“The grounds upon which an administrative order must be judged are those upon which the record discloses that its action was based.”). Here, the ALJ’s standing decision—adopted by the Commission—clearly rested on the 2004 agreement alone. Appx10; Appx141. The FID credited Mr. Barnett’s testimony—which addressed the 2004 Barnett Agreement, *not* the priority applications—and faulted Roku for not “present[ing] any evidence to the contrary, or indeed, any new evidence at all.” Appx141. Therefore, because the Commission and the ALJ decided the case based on the 2004 Barnett Agreement, it would be improper for this Court to analyze in the first instance whether Mr. Barnett transferred his rights in a CIP application through the priority applications. *See Beloit Corp.*, 742 F.2d at 1423 (“Most importantly, this court does not sit to review what the Commission has not decided.”).

III. The Commission Legally Erred in Finding UEI Satisfied the Economic Prong of the Domestic Industry Requirement

In finding UEI satisfied the domestic industry requirement, the Commission legally erred in two distinct ways. First, the Commission legally erred by not requiring UEI to quantify its domestic industry expenditures “with respect to the *articles protected by the [’196] patent*,” as required by Section 337(a)(3) and this Court’s precedent in *Lelo v. ITC*. Second, the Commission legally erred by not evaluating the substantiality of UEI’s alleged domestic industry expenditures “with

respect to the *articles protected by the [’196] patent*,” as required by Section 337(a)(3), and instead evaluating the substantiality with respect to an unprotected software component of the alleged protected articles. Each of these errors independently justifies reversal of the Commission’s determination.

A. The Domestic Industry Requirement

Section 337 requires that a complainant must demonstrate the existence of a domestic industry relating to each asserted patent.⁹ 19 U.S.C. § 1337(a)(2). The domestic industry requirement may be satisfied in one of three ways: a complainant may show that, with respect to the articles “protected by” the patent, it has made (A) significant investment in plant and equipment, (B) significant employment of labor or capital, or (C) substantial investment in the exploitation of the patent, including engineering, research and development, or licensing. 19 U.S.C. § 1337(a)(3). At issue in this appeal is whether UEI has satisfied subsection (C)’s requirement of “substantial investment” in “exploitation [of the patent], including engineering, research and development, or licensing.” *Id.*

Based on the language of the statute, the Commission has long interpreted the domestic industry requirement as consisting of an “economic prong” and a “technical prong.” *Broadcom Corp. v. ITC*, 28 F.4th 240, 249 (Fed. Cir. 2022)

⁹ While a complainant may also argue that a domestic industry may be “in the process of being established,” this is not at issue on appeal.

(citing *Alloc, Inc. v. ITC*, 342 F.3d 1361, 1375 (Fed. Cir. 2003)). To satisfy the technical prong, a complainant must “identify ‘*actual articles protected*’ by the patent.” *Id.* at 249-50 (quoting *Microsoft Corp. v. ITC*, 731 F.3d 1354, 1361-62 (Fed. Cir. 2013)). That is, a complainant must show the existence of a product that practices the limitations of at least one patent claim.

With respect to the economic prong, a complainant “must demonstrate that its investment in the *protected article* is ‘significant’ or ‘substantial.’” *Id.* at 250 (citing 19 U.S.C. § 1337(a)(3)). These terms of degree are typically used interchangeably, and the Commission has explained that “there is no mathematical threshold test” for what is considered “significant” or “substantial” within the meaning of Section 337. *Certain Male Prophylactic Devices*, Inv. No. 337-TA-546, Comm’n Op. at 38 (Aug. 1, 2007). Instead, the determination “entails an examination of the facts in each investigation, the article of commerce, and the realities of the marketplace.” *Certain Carburetors and Products Containing Such Carburetors*, Inv. No. 337-TA-1123, Comm’n Op. at 8-9 (Oct. 28, 2019) (quoting *Certain Optoelectronic Devices for Fiber Optic Communications*, Inv. No. 337-TA-860, Comm’n Op. at 18-19 (May 9, 2014)). But in all cases, and under the clear language of the statute, “[t]he domestic industry requirement under paragraph 337(a)(3) requires evidence that sufficient economic activities and investments as set forth in subparagraphs (A), (B), or (C) have taken place or are taking place *with respect to the articles protected by the*

asserted patent.” Certain Earpiece Devices and Components Thereof, Inv. No. 337-TA-1121, Comm’n Op. at 17 (Nov. 8, 2019) (citing 19 U.S.C. 1337(a)(3) and *Certain Variable Speed Wind Turbines & Components Thereof*, Inv. No. 337-TA-376, Comm’n Op. at 21 (Nov. 1996)).

B. The Commission Legally Erred by Not Requiring UEI to Appropriately Quantify Its Domestic Industry Expenses

In *Lelo*, this Court explained that before the Commission can determine whether a complainant’s investments are “significant” or “substantial,” it must first quantify the alleged domestic industry investments. *Lelo*, 786 F.3d at 883-884. Despite the plain language of Section 337 requiring that the relied-upon investments be “with respect to the articles protected by the patent,” the Commission, in affirming the ALJ’s subsection (C) findings, committed legal error in determining that a complainant relying on R&D and engineering expenses under subsection (C)—unlike a complainant relying on plant and equipment or labor and capital expenses under (A) and (B)—need not allocate its expenses to the protected articles.

The combination of the clear language of the statute and past Federal Circuit and Commission precedent shows the opposite—the “with respect to” preamble applies to all three subsections, and a complainant relying on engineering and research and development expenditures under subsection (C) must allocate those expenditures to articles that are actually protected by the patent. Absent such an allocation, there is a risk that a complainant may rely on expenses *unrelated to the*

protected articles. *Cf. Microsoft Corp. v. ITC*, 731 F.3d 1354, 1361 (Fed. Cir. 2013). In *Microsoft*, this Court noted that there was “no question about the substantiality of Microsoft’s investment in its operating system or about the importance of the operating system to mobile phones on which it runs.” *Id.* But the Court also explained that was “not enough under the statute”—Section 337 “unmistakably requires that the [domestic industry] investments relate to actual ‘articles protected by the patent,’” whether under subsection (C) or otherwise. *Id.* at 1361-62. Indeed, just a few months earlier, this Court made this clear in *InterDigital Communications, LLC v. ITC*:

The “substantial investment in [the patent’s] exploitation, including engineering, research and development, or licensing” **must be “with respect to the articles protected by the patent,”** which means that **the engineering, research and development, or licensing activities must pertain to products that are covered by the patent** that is being asserted. Thus, just as the “plant or equipment” referred to in subparagraph (A) must exist with respect to articles protected by the patent, such as by producing protected goods, **the research and development or licensing activities referred to in subparagraph (C) must also exist with respect to articles protected by the patent,** such as by licensing protected products. This accords with the common description of the domestic industry requirement as having two “prongs”: the “economic prong,” which requires that there be an industry in the United States, and the “technical prong,” **which requires that the industry relate to articles protected by the patent.**

707 F.3d 1295, 1297-98 (Fed. Cir. 2013). Accordingly, the relied-upon expenditures must both (1) be made in the exploitation of the ’196 patent, and (2) “relate to articles protected by the patent.” Thus, under subsection (C), expenditures must be allocated

to the protected articles. Consistent with that principle, the Commission has long required that a complainant must allocate its domestic expenses to the domestic industry product—without such allocation, the domestic industry may erroneously include expenses unrelated to the protected articles, in violation of the statute. *See Prophylactic Devices*, Inv. No. 337-TA-546, Comm’n Op. at 39; *Earpiece Devices*, Inv. No. 337-TA-1121 at 17; *see also Certain Electronic Stud Finders, Metal Detectors and Electrical Scanners*, Inv. No. 337-TA-1221, Comm’n Op. at 48-55 (Mar. 14, 2022) (finding complainant failed to properly allocate expenditures to “articles protected by the asserted patent(s)” under subsections (A), (B), and (C)).

Here, there is no dispute that UEI *did* perform an allocation for its labor and capital expenses under subsection (B),¹⁰ and that UEI *did not* allocate its alleged R&D/engineering investments to “articles protected by the asserted patent” under subsection (C). Indeed, UEI expressly argued that “there is no need to allocate the engineering and R&D investments in the QuickSet Platform to the Samsung DI Products (e.g. Samsung TVs) because . . . all of the R&D investments [have] a strong and direct nexus to the claimed features of the Asserted Patents.” Appx26880.

To be sure, the Commission has long required that because investments under subsection (C) must entail “exploitation” of the Asserted Patent, there must be a

¹⁰ As previously explained, the Commission took no position with respect to the ALJ’s findings with respect to subsection (B). Accordingly, the Commission’s domestic industry determination rests solely upon satisfaction of subsection (C).

nexus between the investments and the Asserted Patent—an additional factor not present when relying on plant and equipment or labor and capital expenses. *Certain Integrated Circuit Chips and Products Containing the Same*, Inv. No. 337-TA-859, Comm’n Op. at 42 (Aug. 22, 2014). But while showing a nexus is *required* under subsection (C), it is not *sufficient*. The relevant question for this Court is not whether UEI’s expenses that purportedly have *a nexus to the ’196 patent* are substantial—the question is whether UEI’s expenses *with respect to the articles protected by the ’196 patent and that have a nexus to the ’196 patent* are substantial. The Commission legally erred by using “nexus” as a proxy for UEI’s failure to allocate its investments to the patent-practicing articles, as required by Section 337. The Court should therefore reverse the Commission’s finding that UEI satisfied the economic prong of the domestic industry requirement.

C. The Commission Committed Legal Error Because it Failed to Evaluate the Substantiality of UEI’s Investments in the Context of the Protected Articles—*Samsung’s* Televisions

The Commission’s domestic industry analysis suffers from a second, independent legal defect. As previously explained, Section 337(a)(3)(C) requires that investments must be substantial “with respect to the *articles* protected by the patent.” Thus, evaluation of substantiality requires a complainant to not just produce evidence of its R&D and engineering investments in absolute terms, but show how those investments compare in the context of other investments in “the *articles*

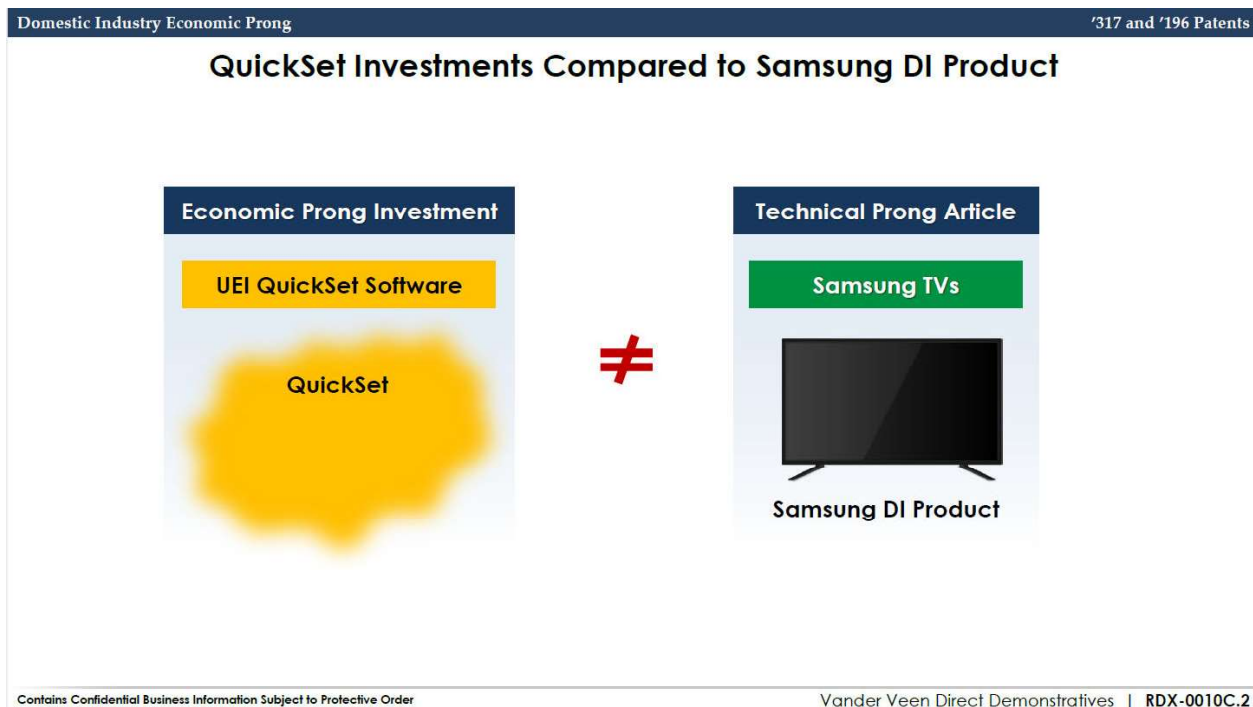
protected by the patent.”¹¹ In other words, a complainant must compare its domestic expenditures in the protected articles to other expenditures in the protected articles. UEI did not just fail to perform this comparison, but it did not present evidence allowing for this context analysis to be made by the Commission, and the Commission committed legal error by failing to require an evaluation of UEI’s proffered investments in the context of other investments made in the “articles protected by the patent.” 19 U.S.C. § 1337(a)(2)-(3).

As noted above, while UEI relied on its investments in QuickSet software for purposes of the economic prong, it acknowledged—as it must—that its QuickSet software alone does not practice (and is therefore not “protected by”) the ’196 patent.¹² Thus, to satisfy the technical prong, UEI relied only upon certain Samsung televisions—which are manufactured abroad by Samsung, not UEI, and merely incorporate the QuickSet software as one of their many components.

UEI’s reliance solely upon investments in QuickSet to satisfy the economic prong of the domestic industry requirement created a mismatch:

¹¹ Because the statute requires that the investments be “substantial” “with respect to” the protected articles, this substantiality analysis must be done in addition to and after the allocation discussed above has taken place. *See supra*, § III.B.

¹² Even if QuickSet itself practiced the ’196 patent, it could not be a protected “article” because it is merely software. *See ClearCorrect Operating, LLC v. ITC*, 810 F.3d 1283, 1289-94 (Fed. Cir. 2015).



Appx55167. This mismatch led the Commission to commit legal error in affirming the ALJ’s determination that UEI satisfied Section 337’s domestic industry requirement.

Section 337 explicitly requires that the relevant “industry”—*i.e.*, investments—is with respect to the domestic industry *article* protected by the patent, not to an unprotected component. As this Court explained in *Lelo*, Section 337’s requirement for “substantial” investments “denote[s] ‘an assessment of the *relative* importance of the domestic activities.’” 786 F.3d at 883 (quoting *Certain Concealed Cabinet Hinges and Mounting Plates*, Inv. No. 337-TA-289, 1990 WL 10608981, Comm’n Op. at *11 (Jan. 8, 1990)). The Court further explained in *Lelo* that the Commission evaluates the “relative importance” of an investment “relative to [the] *overall investment with respect to the articles at issue.*” *Id.* at 883-84 (citing *Cabinet*

Hinges, Inv. No. 337-TA-289, 1990 WL 10608981, at *11-12). And since *Lelo*, the Commission has continued to recognize that “the magnitude of the investment cannot be assessed without consideration of the nature and importance of the complainant’s activities *to the patented products* in the context of the marketplace or industry in question.” *Carburetors*, Inv. No. 337-TA-1123, Comm’n Op. at 18 (quoting *Certain Printing and Imaging Devices and Components Thereof*, Inv. No. 337-TA-690, Comm’n Op. at 31 (Feb. 17, 2011)).

Roku raised this very issue with the ALJ and the Commission during the Investigation. *See* Appx27112-27116; Appx27369-27373. As Roku explained, the protected articles are complex Samsung televisions, but UEI’s expenditures relate only to QuickSet, a minor software component of those complex articles. A proper substantiality analysis under Section 337 and Federal Circuit precedent must examine UEI’s QuickSet-related expenditures in the context of the “articles protected by the patent”—*i.e.*, the expenditures in the Samsung televisions, whether from UEI, Samsung, or others.¹³ Apparently recognizing the critical relevance of such information, UEI itself served a subpoena on Samsung early in the

¹³ Indeed, the record shows that QuickSet is an insignificant and insubstantial component that adds little value to the complex Samsung televisions. For example, Samsung paid UEI a licensing fee of a mere Dollar Amount per television to use QuickSet—a minuscule fraction of the total cost of a Samsung television, which may sell for hundreds or even thousands of dollars. Appx50000, Appx50068 (Samsung Software License); Appx46480-46502 (Samsung television pricing); Appx40351 (1064:10-1065:10); Appx55176.

Investigation, seeking information on Samsung's investments in plant and equipment, labor and capital, and R&D and engineering. Appx28389-28425. In doing so, UEI specifically averred that "the requested materials are essential to the Investigation, directed to specific elements of the domestic industry investigation." Appx28390-28391. Yet in the end, UEI presented no evidence of any Samsung investments, arguing that investments made in the protected articles by third parties are irrelevant to the domestic industry analysis. The Commission's finding that UEI's expenditures are quantitatively substantial thus erroneously relies upon a comparison between (1) UEI's R&D and engineering expenditures purportedly related to the Samsung televisions and (2) *UEI's own total QuickSet expenditures*, and does not consider the relative importance of these UEI investments to "overall investments" in the protected articles. *Lelo*, 786 F.3d at 883-84 (citing *Cabinet Hinges*, Inv. No. 337-TA-289, 1990 WL 10608981, at *11).

The Commission's fundamental legal error flies in the face of *Lelo* and Section 337. Because the Commission performed its substantiality analysis in the context of an unprotected component (QuickSet), not the protected articles (Samsung televisions), this is a second reason why the Court should reverse the Commission's finding that UEI satisfied the economic prong of Section 337.

IV. The Commission Erred in Finding the '196 Patent's Claims Non-Obvious

The Commission's determination that the asserted claims of the '196 patent are not invalid under 35 U.S.C. § 103 was based on erroneous legal conclusions and factual findings unsupported by substantial evidence. First, the Commission's *prima facie* obviousness analysis was legally erroneous and factually unsupported, particularly because it adopted an improper requirement that one of the prior art references must disclose the purported "fundamental tenet" of the claimed invention rather than considering the combined teachings of the references. Second, the Commission's motivation to combine analysis was contrary to law and factually unsupported, as exemplified by its erroneous requirement that the motivation to combine must be found in the references themselves. Third, the Commission's secondary considerations analysis was legally erroneous and factually unsupported, as it misapplied this Court's precedent relating to the required "nexus" between the claimed invention and the secondary considerations at issue. Because, as set forth below, the Commission's obviousness analysis misapplied this Court's precedent, and was not based on substantial evidence, this Court should reverse the finding of non-obviousness.¹⁴

¹⁴ Though the Commission found a violation with respect to independent claim 1 and dependent claims 3, 11, and 13-15, its determination of non-obviousness rested solely on its analysis of claim 1. Appx29-31. Should this Court reverse the determination of non-obviousness as to claim 1, there is no need for any remand, as

A. The Commission’s Obviousness Analysis Was Legally Flawed Because it Improperly Dismissed Chardon and Mishra for Not Individually Disclosing the Alleged “Fundamental Tenet” of Claim 1, Rather Than Addressing the Combined Teachings of the Prior Art

Before the Commission, Roku argued that the combination of Chardon and Mishra rendered all asserted claims of the ’196 patent obvious. In rejecting Roku’s obviousness theory, the Commission committed legal error in concluding that the differences between the claimed invention and the prior art are “substantial” by improperly comparing the claimed invention to each reference individually rather than to the proposed combination of references.

In particular, the Commission concluded that the differences between the prior art and the claimed invention were substantial because “neither Chardon nor Mishra discloses the ‘fundamental tenet’ of the ’196 patent’s invention, namely, a system configured to choose between two different control devices to trans[m]it commands over different pathways.” Appx29.¹⁵ However, this was legal error because the test

the Commission did not disturb the ALJ’s findings that the prior art references at issue would have rendered dependent claims 3, 11, and 13-15 obvious but for the findings with respect to claim 1. Appx23, Appx31 (adopting the FID’s obviousness analysis with specific modifications unrelated to dependent claims); Appx171-173 (“The additional features of the various dependent claims are all disclosed in either Chardon or Mishra.”).

¹⁵ As discussed *infra*, Roku never argued that Chardon disclosed that its media device was programmed to use two different control devices, but rather that the claimed use of two different control devices was obvious in combination with Mishra because replacing Chardon’s *use* of an IR blaster with Mishra’s use of the

for obviousness is not what a single reference discloses individually, but “what the *combined* teachings of the references would have suggested to those having ordinary skill in the art.” *In re Mouttet*, 686 F.3d 1322, 1333 (Fed. Cir. 2012).

The Commission also determined that the differences were substantial because “neither Chardon nor Mishra discloses transmitting ‘second data’ to the remote control ‘for use in configuring the remote control device to transmit’ commands in the manner set forth in limitation 1[e].” Appx29 (citing Appx40941 (938:10-24); Appx163, Appx166-167, Appx171).¹⁶ This was error because it is well-established that for obviousness, unlike anticipation, there is no legal requirement to show all of the limitations in a single reference. *In re Keller*, 642 F.2d 413, 425 (CCPA 1981) (“The test for obviousness is not . . . that the claimed invention must be expressly suggested in any one or all of the references” but rather “what the *combined* teachings of the references would have suggested to those of ordinary skill in the art.”); *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (“Non-obviousness cannot be established by attacking references individually”) (citations omitted). Similarly, there is no requirement that a single reference has to supply the entirety of even an individual limitation. *Nike, Inc. v.*

technique of relaying of IR codes through a remote control would have been a simple substitution. Appx27033; Appx27721-27722; Appx40320 (939:9-942:24).

¹⁶ At the hearing and in briefing before the Commission, Roku referred to the limitation identified by the Commission as “1[e][ii]” of claim 1 of the ’196 Patent as limitation “1.f”. Appx27044; Appx12-13.

Adidas AG, 812 F.3d 1326, 1335 (Fed. Cir. 2016) (“A claimed invention may be obvious even when the prior art does not teach each claim limitation, so long as the record contains some reason why one of skill in the art would modify the prior art to obtain the claimed invention”). Indeed, Roku never argued that either Chardon or Mishra *individually* taught the entirety of limitation 1[e] of the ’196 patent.

Thus, although Chardon does not disclose sending data to a remote control to configure it to control another device, that limitation was rendered obvious by the well-known technique of relaying key codes through a remote control, such as the technique disclosed in Mishra. Appx27033; Appx50109-50110 (¶¶ 20, 37, 39), Appx50101; Appx40319-40320 (938:10-940:4). It is undisputed that Mishra discloses sending data to the remote control to configure it to control other devices. In particular, Mishra discloses that, in response to a button press on the remote, “[t]he master [STB or System 12] in turn sends the RCU the necessary codes to increment the channel on the TV” and “[t]he RCU then takes these codes and sends them, for example using a unidirectional infrared signal, to the TV using the protocols stored in the RCU's memory.” Appx50110 (¶¶ 37-39); Appx40319-40320 (938:10-939:20); *see also* Appx78-80, Appx82, Appx161. And, it is undisputed that sending IR codes to the remote control is sufficient to satisfy this language of limitation 1[e][ii] because the Commission found the exact same functionality in the accused devices to infringe. Appx20-22.

Finally, the Commission also concluded that the differences were substantial because Mishra “does not disclose using an HDMI connection.” Appx29. However, Mishra’s failure to disclose an HDMI connection is irrelevant because Chardon discloses the HDMI connection. Appx162-163 (citing Appx46461 (¶¶ 38-40), Appx46452). Once again, the Commission’s analysis legally erred by analyzing the prior art references individually rather than in the proposed combination as required by this Court’s precedent. *In re Mouttet*, 686 F.3d at 1333.

B. The Commission’s Motivation to Combine Analysis Was Replete With Legal Errors

The Commission committed numerous legal errors in determining that a person of ordinary skill in the art would not have been motivated to combine Chardon and Mishra in the manner claimed. As explained below, had the Commission evaluated the record evidence under the correct legal standards, it would have found the asserted claims obvious.

First, the Commission legally erred in finding no motivation to combine Chardon and Mishra on the grounds that there was “no teaching, suggestion, or motivation *in Chardon or Mishra* to divide control of the target devices between two different control devices.” Appx30 (emphasis added). But this plainly contradicts the Supreme Court’s holding in *KSR*, which rejected any requirement that the prior art references themselves must recite a teaching, suggestion, or motivation to

combine. *KSR*, 550 US at 418-19.¹⁷ Moreover, although choosing between two different control devices may be a purpose of the '196 patent, it is well-established that obviousness may be proven by showing that a person of ordinary skill in the art would have been motivated by a different purpose to combine the prior art in the manner claimed. *See id.* at 420 (“[A]ny need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.”); *In re Kahn*, 441 F.3d 977, 989 (Fed. Cir. 2006) (“[T]he skilled artisan need not be motivated to combine [a prior art reference] for the same reason contemplated by the [inventor].”). Here, Roku identified a particular motivation to combine Chardon and Mishra in the manner claimed—overcoming the known problems of IR blasters by using the well-known technique of relaying IR codes through a remote control. Appx27033 (citing Appx40265 (832:16-833:2), Appx40321 (945:7-18); Appx55009; Appx46473, Appx46478 (6:40-53); Appx46461 (¶¶ 37, 39)). The Commission legally erred by injecting into its obviousness analysis the requirement that the motivation to combine must be found in the references themselves.

Second, the Commission legally erred in concluding that the proposed combination “would run contrary to Chardon’s teaching that either the multi-media

¹⁷ As Roku’s expert at trial explained, there was, in fact, a suggestion in Chardon to relay IR codes through the remote control. Appx40319 (935:17-938:9); Appx46461 (¶ 43). The Commission did not address this evidence.

gateway or the remote control, but not both, is used to control all of the target devices.” Appx30. Contrary to the Commission’s analysis, a reference does not teach away simply because the reference does not disclose the components arranged in the claimed manner. Rather, teaching away requires criticizing, discrediting, or otherwise discouraging use of the claimed approach. *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004). Under the correct legal standard, Chardon does not teach away from use of the multi-media gateway and remote control together because Chardon does not affirmatively criticize or discredit such use.¹⁸

Third, the Commission legally erred in misapprehending Roku’s proposed combination as requiring physically adding components from Mishra to Chardon. In particular, the Commission found there would be no motivation to combine Chardon and Mishra on the grounds that “it would be ‘duplicative’ and ‘wasteful’ to add a second IR command path that involves the remote control.” Appx30. To the extent the Commission assumed that obviousness required physically combining components of Mishra and Chardon, that was legal error, as physical combinability is largely irrelevant to the obviousness analysis. *See Uber Techs., Inc. v. X One, Inc.*, 957 F.3d 1334, 1341 (Fed. Cir. 2020). Moreover, the unrebutted expert testimony demonstrated that the proposed combination would involve no additional

¹⁸ To the contrary, Chardon expressly discloses embodiments that involve simultaneous use of the multi-media gateway and remote control. Appx46464-46465 (¶ 62).

hardware beyond what was already present in Chardon. Appx27033; Appx27721-27722; Appx40320 (940:7-942:15). In any event, the Commission erred because Roku's proposed combination did not involve adding a second IR command path. In particular, Roku's proposed combination was expressly based on *replacing* Chardon's *use* of IR blasters with Mishra's use of relaying IR codes through a remote control, thereby making the remote control the path by which IR codes are transmitted. Appx27033; Appx27721-27722; Appx40320 (940:7-942:15). Thus, there was no "second IR command path" in Roku's proposed combination, and the Commission's conclusion of no motivation to combine was erroneous and unsupported by substantial evidence because it was based on a misapprehension of Roku's proposed combination.

Fourth, the Commission legally erred in finding no motivation to replace Chardon's IR blasters with Mishra's relaying of IR codes through a remote control on the grounds that IR blasters have "some advantages" and that "their alleged problems" can be solved "through other means," and that it would have been "more complicated" to use "two controlling devices." Appx30. This was legal error because it is well established that the motivation to combine references in a particular manner "need not be supported by a finding that the prior art suggests that the combination claimed . . . is the preferred, or most desirable, combination." *Bayer Healthcare Pharms., Inc. v. Watson Pharms., Inc.*, 713 F.3d 1369, 1376 (Fed. Cir.

2013) (quoting *In re Fulton*, 391 F.3d at 1200). Roku presented un rebutted evidence that “IR blasters” are “difficult to line up effectively or connect inside an entertainment cabinet,” and that a POSA would therefore have been motivated to replace Chardon’s IR blasters with Mishra’s relaying of IR codes through a remote control. Appx27721 (citing Appx40320 (940:18-942:24)). Thus, it was legal error for the Commission to require Roku to “prove that a person of ordinary skill would have selected” the proposed combination of Chardon and Mishra “over other prior art” methods for addressing the problems of IR blasters or over simpler control methods. *Novartis Pharms. Corp. v. West-Ward Pharms. Int’l Ltd.*, 923 F.3d 1051, 1059 (Fed. Cir. 2019). Moreover, the Commission’s characterization of the proposed combination of “Mishra and Chardon” as “more complicated” because it would use “two controlling devices (e.g., a set top box and a remote control),” (Appx30) was not supported by substantial evidence, as Chardon itself already discloses a system with a set top box (*i.e.*, multi-media gateway) and a remote control, both of which are used to control other devices. Appx27028-27029; Appx46451 (elements 115, 110), Appx46460-46462 (¶¶ 30-31, 45), Appx46464-46465 (¶ 62).

C. The Commission’s Analysis of Secondary Considerations Disregarded this Court’s Precedent and Was Factually Unsupported

Finally, the Commission erred in its obviousness analysis by crediting UEI’s alleged evidence of secondary considerations in contravention of this Court’s precedent.

Secondary considerations of non-obviousness (also known as objective indicia) are only material to an obviousness analysis when there is a nexus to the claimed invention, and UEI, as the patentee, “bears the burden of showing that a nexus exists.” *WMS Gaming, Inc. v. Int’l Game Tech.*, 184 F.3d 1339, 1359 (Fed. Cir. 1999); *Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1312 (Fed. Cir. 2006). A nexus is “a legally and factually sufficient connection between the [secondary consideration] and the patented invention,” *i.e.*, the secondary indicia at issue was “driven by [a] novel aspect of the claimed invention.” *ABT Sys., LLC v. Emerson Elec. Co.*, 797 F.3d 1350, 1361 (Fed. Cir. 2015); *see Asyst Techs.*, 544 F.3d at 1316 (success or praise attributable to “overall system,” as opposed to novel “substitution,” is inadequate to overcome *prima facie* obviousness showing). A patentee is entitled to a presumption that a nexus exists only when the product is “coextensive” with the patent claim. *Fox Factory*, 944 F.3d at 1373-74. A product is not coextensive with the claim if the patented invention is only a component of the product. *Id.* at 1374.

The Commission determined that secondary considerations supported non-obviousness on two grounds. First, the Commission concluded that UEI was entitled to a presumption of a nexus because the evidence was tied to specific Samsung products that practice the claimed invention. Appx31. Second, the Commission concluded that UEI had shown a sufficient nexus because the evidence “identifies the use of two controlling devices.” *Id.* Both of these findings were legally erroneous and lacked substantial evidence.

1. The Commission Erred in Presuming a Nexus When There Was No Showing of Coextensiveness

The Commission’s conclusion that UEI is entitled to a presumption of a nexus merely because the domestic industry products—Samsung televisions—were found to practice the claimed invention violates this Court’s precedent. In particular, the Commission, citing to this Court’s decision in *Immunex Corp. v Sandoz, Inc.*, 964 F.3d 1049, 1067 (Fed. Cir. 2020), found that UEI is “entitled to a presumption of a nexus because it has shown that this objective evidence is tied to specific Samsung products that practice the invention disclosed and claimed in the ’196 patent.” Appx31. However, the Commission clearly misapprehended this Court’s holding in *Immunex*. Contrary to the Commission’s finding, *Immunex* did not hold that *merely* practicing a claimed invention is sufficient to presume a nexus. Rather, *Immunex* confirmed that a presumption of a nexus requires that the commercial “product is the invention disclosed and claimed in the patent.” *Immunex*, 964 F.3d at 1067

(citation omitted). And, as this Court explained in *Fox Factory*, this requires a conclusion that the product is *coextensive* with the patent's claims. *Fox Factory*, 944 F.3d at 1371-75. Neither the Commission nor the ALJ attempted to perform any coextensiveness analysis.

Indeed, as Roku argued to the Commission, there is no dispute that the Samsung televisions are multifunctional television devices with numerous features that are entirely unrelated to claim 1 of the '196 patent. Appx25598. For example, the Samsung televisions have screens which were praised in a Wall Street Journal article—but claim 1 of the '196 patent does not require any type of screen. *Id.*; Appx50080 (praising “impressively bright and colorful” screen); Appx674 (cl. 1). Additionally, undisputed testimony demonstrated that the Samsung televisions can be used without using the QuickSet functionality alleged to practice the '196 patent. Appx40174 (565:4-566:5).

Thus, the Commission wholly ignored this Court's requirement that the presumption of nexus is only triggered by coextensiveness, and instead committed legal error by assuming that merely “practicing” the patent is sufficient. For the same reason, no substantial evidence supports the Commission's conclusion that UEI was entitled to the presumption of a nexus.

2. The Commission Erred in Finding that UEI had Demonstrated a Nexus to the Secondary Considerations

Additionally, the Commission legally erred in concluding that UEI had demonstrated that a nexus exists as to long-felt need, industry praise, and widespread adoption because the Commission wholly ignored the requirement that there must be a nexus to the novel elements recited in the asserted claims. Appx31 (citing Appx169-171).¹⁹ Moreover, the Commission’s conclusion regarding existence of a nexus is not supported by substantial evidence.

As to long-felt need, the Commission relied upon testimony from UEI’s expert that the ’196 patent “solved specifically” the problem of a “proliferation of devices” and “communication methods” by “determining the best command control path for any given device to have reliable user-friendly operation.” Appx169, Appx31. However, as discussed above, the Commission found that Chardon discloses exactly that. Appx160 (“Chardon discloses embodiments that choose between IR and CEC codes.”) (citing Appx46459-46460 (¶¶ 12, 14, 20, 33-34), Appx46463-46464 (¶¶ 58-59), Appx46466 (¶ 68), Appx46455 (elements 510-530); Appx40281-40282 (896:3-25, 898:21-901:11)); Appx27. As a matter of law, no

¹⁹ The ALJ expressly made findings as to industry praise, long-felt need, and widespread adoption. Appx169-171. The Commission’s opinion mentions that the “secondary considerations” “include[]” “industry praise” and “widespread adoption,” but does not expressly mention long-felt need. Appx31. This brief addresses all three considerations, to the extent the Commission adopted the ALJ’s findings as to long-felt need.

nexus exists when the secondary considerations are directed to elements found in the prior art. *Ormco Corp.*, 463 F.3d at 1311-12 (Fed. Cir. 2006) (“[I]f the feature that creates the commercial success was known in the prior art, the success is not pertinent.”); *In re Huai-Hung Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011) (“Where the offered secondary consideration actually results from something other than what is both claimed and *novel* in the claim, there is no nexus to the merits of the claimed invention.”) (citations omitted). The Commission disregarded this precedent, adopting the ALJ’s conclusion that “Chardon does not solve the same long-felt need as the 196 patent, because it does not teach the same type of interactions between a remote control and a first media device.” Appx171. However, this is a legally irrelevant non-sequitur. Nothing in the alleged “need” articulated by the Commission or ALJ required “the same type of interactions between a remote control and a first media device.” Compare Appx169, with Appx171. That is, the fact that Chardon does not anticipate (*i.e.*, because it does not expressly send second data to configure a remote control) does not mean that Chardon did not disclose an approach that solved the alleged long-felt need resulting from the proliferation of devices and communication methods.

The Commission also relied upon two news articles as additional evidence of “long felt need” as well as evidence of “industry praise”: a Wall Street Journal publication and a CNET publication. Appx169-170; Appx31. But this evidence

also fails to satisfy the requirement that the secondary consideration must have a nexus to what is “both claimed and novel.” *In re Huai-Hung Kao*, 639 F. 3d at 1068. As to the Wall Street Journal publication, the Commission noted that it had a figure depicting all the physical components of claim 1 of the ’196 patent. Appx31; Appx170 (citing Appx50081). However, claim 1 is plainly directed to far more than the physical components. Indeed, the majority of claim 1 relates to the specific “instructions” on a “first media device.” Appx674 (cl. 1). The cited figure in the Wall Street Journal publication makes no mention of the claimed instructions to send a command via *HDMI-CEC* when first data indicates the controlled device would be responsive to such a command. Rather, it solely envisions control by “wirelessly teach[ing] its remote how to control the [other] devices” including “point[ing] the same remote at a device you want to control.” Appx50081. Indeed, the only reference to control via HDMI-CEC identified by the Commission (through adopting the ALJ’s findings) in the Wall Street Journal publication was the statement that “some equipment uses infrared signals, while others communicate via HDMI.” Appx31 (adopting Appx170 (citing Appx50080)). However, this simple factual statement about the various ways that devices can be controlled does not rise to the level of substantial praise of the novel claim elements of the ’196 patent, given the disclosures of the prior art, including Chardon, which already discuss use of HDMI-CEC.

The CNET publication that the Commission relied upon is equally inadequate. In particular, the Commission adopted the ALJ’s erroneous finding that the article praises the claimed invention merely because it mentions that “if the device works with HDMI-CEC . . . the TV can recognize that and control it accordingly, [thereby] operating the device via the HDMI connection” and “[i]f HDMI does not work, ‘the TV . . . queries its database and programs the IR (infrared) commands of the TV remote automatically.’” Appx31 (citing Appx170 (citing Appx50088)). However, this passage merely *describes*—not *praises*—this functionality of the Samsung televisions. And the cited passage also describes unclaimed functionality, including “mapping the TV remote buttons to the appropriate commands.” Appx50088.

Both the Wall Street Journal and CNET publications suffer from the same flaw as the other long-felt-need evidence: there is no praise specifically directed to the *novel* elements, *i.e.*, those elements missing from Chardon. In particular, although both publications *mention* the remote control, neither article *praises* the claimed technique of configuring the remote control rather than issuing IR signals directly from the TV. Appx674 (cl. 1); Appx50079-50084; Appx50085-50099; Appx40327-40328 (968:11-974:5). Indeed, neither publication contains any meaningful, specific discussion of how the Samsung televisions improve upon the prior art (*i.e.*, choosing between CEC commands and IR commands sent via an IR blaster), and instead at most merely *mentions* some claim limitations. Accordingly,

the Commission erred by failing to consider whether the alleged secondary considerations evidence was directed to the *novel* elements of claim 1. Indeed, there is no substantial evidence to support the existence of a nexus under the proper legal standard.

Finally, as to “widespread adoption,” the Commission cited evidence of the number of QuickSet operations per year by Samsung customers using their Samsung TVs. Appx31; Appx169-170. But the Commission legally erred in crediting such evidence without any showing that this reflected a substantial share of the TV market. *See Cable Elec. Prods., Inc. v. Genmark, Inc.*, 770 F.2d 1015, 1026-27 (Fed. Cir. 1985) (rejecting purported secondary consideration that did not include “economic evidence” showing “a substantial share of [a] definable market”); *In re Baxter Travenol Labs.*, 952 F.2d 388, 392 (Fed. Cir. 1991). Indeed, the only evidence presented by UEI was that a single manufacturer, Samsung, had adopted the claimed invention of the ’196 patent through the use of QuickSet, and the Commission failed to consider whether the use of QuickSet by Samsung customers constituted “widespread adoption” in the context of the overall TV market. Additionally, the Commission erred because merely showing that there are many QuickSet operations per year using Samsung TVs provides no evidence of widespread adoption of the specific functionality claimed in the ’196 patent. In particular, because there was no showing that every QuickSet operation corresponds

to a separate instance of practicing the '196 patent, the number of QuickSet operations per year provides no evidence of the number of times the claimed functionality of the '196 patent is actually utilized.

And once again, the Commission's analysis fails to show a nexus to the specific, novel limitations of the asserted claims of the '196 patent. In particular, the Commission did not find (because it could not) that QuickSet or the Samsung televisions were coextensive with any claim of the '196 patent, or that the purported widespread adoption of QuickSet was attributable to the *novel* features of the '196 patent. Appx170-171; Appx31. Although the Commission cited testimony from Mr. Barnett that QuickSet "control rules" would cause a television to choose between CEC and IR, the Commission cited no evidence that QuickSet necessarily entails configuring the remote to use IR rather than using an IR blaster, little less that such functionality of QuickSet was the basis for any alleged widespread adoption. Appx169-170 (citing Appx40014-40015).

Moreover, in finding a nexus of "widespread adoption" of QuickSet, the Commission disregarded evidence that QuickSet includes various distinct modules and capabilities unrelated to the '196 patent. Appx46353-46361 (113:12-13, 113:22-114:19, 115:14-147:18); Appx40326-40327 (966:13-967:20). Indeed, the undisputed record evidence, which the Commission itself credited, demonstrated that the comprehensiveness of QuickSet's database of IR codes—an unclaimed

feature—was one of QuickSet’s selling points. Appx46128-46135 (128:15-135:7); Appx40326-40327 (966:24-967:20); Appx171. Accordingly, the Commission applied an erroneous legal standard and lacked substantial evidence in concluding that a sufficient nexus existed between the alleged “widespread adoption” of QuickSet and the asserted claims of the ’196 patent.

CONCLUSION

For the foregoing reasons, Roku, Inc. respectfully requests that this Court reverse the decision of the United States International Trade Commission finding that 1) UEI has standing to assert the ’196 patent; 2) UEI satisfied the economic prong of the domestic industry requirement; and 3) the asserted claims are valid.

Respectfully submitted,

/s/ Matthew J. Rizzolo

Matthew J. Rizzolo
Brendan F. McLaughlin
ROPES & GRAY LLP
2099 Pennsylvania Avenue, NW
Washington, DC 20006-6807
Phone: (202) 508-4600

Andrew Thomases
ROPES & GRAY LLP
1900 University Avenue, 6th floor
East Palo Alto, CA 94303
Phone: (650) 617-4000

Matthew R. Shapiro
Michael A. Morales
ROPES & GRAY LLP
1211 Avenue of the Americas
New York, NY 10036
Phone: (212) 596-9000

Counsel for Roku, Inc.

Jonathan D. Baker
DICKINSON WRIGHT RLLP
800 W. California Avenue, Suite 110
Sunnyvale, CA 94086
Phone: (408) 701-6180

Michael D. Saunders
DICKINSON WRIGHT PLLC
607 W 3rd Street
Austin, TX 78703
Phone: (512) 770-4208

Dated: June 15, 2022

ADDENDUM

NONCONFIDENTIAL VERSION

**UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.**

In the Matter of

**CERTAIN ELECTRONIC DEVICES,
INCLUDING STREAMING PLAYERS,
TELEVISIONS, SET TOP BOXES,
REMOTE CONTROLLERS, AND
COMPONENTS THEREOF**

Investigation No. 337-TA-1200

COMMISSION OPINION

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I. INTRODUCTION

On September 9, 2021, the Commission determined to review in part the final initial determination (“ID”) issued on July 9, 2021, by the presiding administrative law judge (“ALJ”). 86 Fed. Reg. 51381 (Sept. 15, 2021). On review, the Commission affirms the ID’s finding that there is a violation of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337 (“Section 337”), with respect to U.S. Patent No. 10,593,196 (“the ’196 patent”). The Commission further affirms the ID’s findings that there is no violation of Section 337 with respect to U.S. Patent Nos. 7,589,642 (“the ’642 patent”) or 10,600,317 (“the ’317 patent”), for the reasons stated in the ID, as modified herein.

The Commission has determined to issue a limited exclusion order and cease and desist order against respondent Roku Inc. (“Roku”), and it finds the public interest does not preclude issuing such a remedy. The Commission has also determined to set a bond in the amount of zero (0) percent of entered value of subject imports during the period of Presidential review. This opinion sets forth the Commission’s reasoning in support of its final determination.

II. BACKGROUND

A. Procedural History

The Commission instituted the present investigation on May 22, 2020, based on a complaint filed by Universal Electronics, Inc. (“UEI”) of Scottsdale, Arizona. 85 Fed. Reg. 31211-212 (May 22, 2020). The complaint, as supplemented, alleges violations of Section 337 in the importation into the United States, sale for importation, or sale in the United States after importation of certain electronic devices, including streaming players, televisions, set top boxes, remote controllers, and components thereof, by reason of infringement of one of more of the asserted claims of the ’196 patent, the ’317 patent, the ’642 patent, and other patents that were

originally asserted but subsequently withdrawn and terminated from the investigation.¹ The notice of investigation named Roku of Los Gatos, California, as a respondent, among others that were later terminated from this investigation.² The Office of Unfair Import Investigations is not a party in this investigation. *Id.*

On August 19, 2020, the presiding ALJ held a technology tutorial and *Markman* hearing. ID at 2. The ALJ issued a *Markman* order on October 1, 2020. *Id.*; Order No. 24 (Oct. 1, 2020).

On January 25, 2021, the ALJ issued Order No. 40, granting Roku's motion for summary determination that UEI lacks standing to assert the '196 patent. Order No. 40 (Jan. 25, 2021). The Commission reversed Order No. 40 and remanded the standing issue to the ALJ for further proceedings. Comm'n Notice (Feb. 24, 2021); Comm'n Op. (Mar. 3, 2021).

¹ The Commission partially terminated the investigation with respect to certain originally asserted claims of the '196 patent, the '317 patent, and the '642 patent as well as U.S. Patent Nos. 7,696,514; 9,911,325; and 9,716,853 in their entirety. *See* Order No. 27 (Dec. 2, 2020), *unreviewed by* Comm'n Notice (Dec. 23, 2020); Order No. 32 (Dec. 21, 2020), *unreviewed by* Comm'n Notice (Jan. 5, 2021); Order No. 33 (Dec. 29, 2020), *unreviewed by* Comm'n Notice (Jan. 13, 2021); Order No. 34 (Jan. 4, 2021), *unreviewed by* Comm'n Notice (Jan. 21, 2021); Order No. 44 (Feb. 2, 2021), *unreviewed by* Comm'n Notice (Feb. 19, 2021); Order No. 49 (Feb. 9, 2021), *unreviewed by* Comm'n Notice (Feb. 24, 2021); Order No. 66 (March 23, 2021), *unreviewed by* Comm'n Notice (April 8, 2021); Order No. 67 (Apr. 6, 2021), *unreviewed by* Comm'n Notice (Apr. 22, 2021).

² In addition to Roku, the Commission's notice of investigation originally named the following respondents: TCL Electronics Holdings Ltd. of New Territories, Hong Kong; Shenzhen TCL New Technology Co. Ltd. of Shenzhen, China; TCL King Electrical Appliances Co. Ltd., Huizhou, China; TTE Technology Inc. of Corona, California; TCL Corp. of Huizhou City, China; TCL Moka Int'l Ltd. of New Territories, Hong Kong; TCL Overseas Marketing Ltd. of New Territories, Hong Kong; TCL Industries Holdings Co., Ltd. of New Territories, Hong Kong; TCL Smart Device Co. of Bac Tan Uyen District, Vietnam; Hisense Co. Ltd. of Qingdao, China; Hisense Electronics Manufacturing Co. of America Corp. of Suwanee, Georgia; Hisense Import & Export Co. Ltd. of Qingdao, China; Qingdao Hisense Electric Co., Ltd. of Qingdao, China; Hisense International Co., Ltd. of Shen Wang, Hong Kong; Funai Electric Co., Ltd. of Osaka, Japan; Funai Corp. Inc. of Rutherford, New Jersey; and Funai Co., Ltd. of Nakhon Ratchasima, Thailand (collectively, "Respondents"). 85 Fed. Reg. at 31212. The Commission subsequently terminated the investigation with respect to all of the respondents other than Roku. *See* Order No. 67 (Apr. 6, 2021), *unreviewed by* Comm'n Notice (Apr. 22, 2021).

The ALJ held an evidentiary hearing from April 19-23, 2021 and issued the final ID on July 9, 2021. The ID finds a violation of Section 337 based on infringement of the '196 patent because: (i) UEI has standing to assert the '196 patent; (ii) the accused Roku Ultra and Soundbar products infringe claims 1, 3, 11, and 13-15 of the '196 patent, although its revised Ultra and Soundbar products do not infringe the asserted claims; (iii) the asserted claims are not invalid as obvious; and (iv) UEI satisfied the technical and economic prongs of the domestic industry requirement with respect to the '196 patent. ID at 84, 88, 98, 101-02, 105-06, 118-21, 133, 137. The ID finds no violation with respect to the '642 patent or '317 patent because their asserted claims, though infringed, are invalid. *Id.* at 137-38.

On July 13, 2021, the Commission issued a notice soliciting public comments on the public interest factors, if any, that may be implicated if a remedy were to be issued. *See* 86 Fed. Reg. 38126 (July 19, 2021). The Commission did not receive any public comments in response to its notice. No party submitted public interest comments pursuant to Commission Rule 210.50(a)(4) (19 C.F.R. § 210.50(a)(4)).

On July 23, 2021, both UEI and Roku filed petitions for review of the final ID. The parties filed their respective replies on August 2, 2021.

On September 9, 2021, the Commission determined to partially review the ID with respect to: (i) all issues relating to the '196 patent (Questions A-D); (ii) whether UEI satisfied the technical prong of the domestic industry requirement with respect to the '317 patent (Question E); and (iii) whether UEI satisfied the economic prong of the domestic industry requirement under Section 337(a)(3)(B) for the '196 patent and '317 patent (Question F), as well

as the '642 patent.³ 86 Fed. Reg. 51381, 51382-83 (Sept. 15, 2021). The Commission did not review any other issues relating to the '317 patent or '642 patent. *See id.*

On September 24, 2021, UEI and Roku filed their initial responses to the Commission's questions on review and remedy, the public interest, and bonding.⁴ On October 1, 2021, the parties filed their replies to each other's initial submissions to the Commission.⁵

On October 26, 2021, while the investigation was still pending final determination by the Commission, Roku filed a Motion for a Limited Reopening of the Record and for a Shortened Response Time ("Motion") so that the Commission could consider allegedly contradictory deposition testimony from a certain UEI fact witness taken in another investigation involving the same parties, products, and technology. *See Certain Televisions, Remote Controls, and Components Thereof*, Inv. No. 337-TA-1263 ("the 1263 Investigation"). On the same date, Roku and UEI filed a Joint Motion to Amend the Protective Order to Add Provisions Relating to Materials from Inv. No. 337-TA-1263 ("Joint APO Motion").

On October 28, 2021, the Commission granted Roku's motion for a shortened response time, directing UEI to file its response by the close of business on November 2, 2021. Comm'n Order (Oct. 28, 2021). The Commission denied the parties' Joint APO Motion as moot. *Id.*

³ Although the Commission's review of the economic prong under Section 337(a)(3)(B) included the '642 patent, Question F itself did not mention that patent.

⁴ *See* Complainant's Response to the Commission's Notice of Review ("UEI's Resp."); Respondent Roku's Opening Submission on the Issues Under Review, Remedy, and Bonding, and Public Interest ("Roku's Resp.").

⁵ *See* Complainant's Reply to Respondent's Opening Submission Regarding the Commission Notice of Review ("UEI's Reply"); Respondent Roku's Reply Submission on the Issues Under Review, Remedy and Bonding, and Public Interest ("Roku's Reply").

On November 2, 2021, UEI filed its opposition to Roku's Motion, in accordance with the Commission's order.

The Commission, having reviewed the parties' submissions, the ID, and the deposition testimony at issue, has determined to deny Roku's motion to reopen the record. Roku argues that certain deposition testimony in the 1263 Investigation contradicts testimony given by the same witness in the present investigation, such testimony allegedly being material to the ID's findings on the technical and economic prongs of UEI's asserted domestic industry and UEI's evidence of secondary considerations of non-obviousness regarding the '196 patent. With regard to the technical prong for the '196 patent, the Commission finds that the proffered deposition testimony does not show that the Samsung DI Products never use UEI's QuickSet software or that they never practice the asserted claims of the '196 patent. Even if the proffered testimony were to be taken into consideration, it does not refute the ID's finding that UEI has satisfied the technical prong of the domestic industry requirement with respect to the '196 patent. Roku's other arguments are moot given that the Commission did not review the ID's findings that UEI satisfied the economic prong requirement under Section 337(a)(3)(C) and the Commission has determined to reverse the ID's finding that Roku made a *prima facie* showing of obviousness with respect to the '196 patent, as discussed below. Roku also has not cited any statute, rule, or precedent in support of such an extraordinary remedy. Accordingly, Roku has not shown sufficient grounds to warrant the extraordinary remedy of reopening the record at this late stage.

B. The Asserted Patents

The three patents at issue in the ID relate to remote control devices and systems that are capable of controlling multiple consumer media devices, such as televisions, set top boxes, digital video recorders ("DVRs"), digital video disc ("DVD") players, and other media devices.

See ID at 4-6. The UEI patents are also directed to systems for streamlining the process of setting up universal control devices or systems for controlling multiple media devices. *Id.*

The following patents and claims are asserted for infringement or domestic industry:

- '196 patent, claims 1-3, 11, and 13-15.
- '317 patent, claims 3, 6, 9, and 11, which all depend on unasserted claim 1.
- '642 patent, independent claim 19.

ID at 4.

C. The Accused Products

The accused products include certain Roku streaming boxes, soundbars, and associated remote control devices. ID at 6-7. UEI accused both the original and revised versions of the Roku Ultra and Roku Soundbar of infringing the '196 patent. *Id.* at 7. UEI originally accused the Roku Ultra, Soundbar, and Streaming Sticks of infringing the '317 patent, but later withdrew its infringement allegations with respect to the Roku Streaming Sticks. *Id.*

D. The Domestic Industry Products

For the '196 and '317 patents, UEI's domestic industry products include certain televisions manufactured by third party Samsung that incorporate UEI's QuickSet software ("Samsung DI Products"), which purportedly enables the Samsung DI Products to satisfy certain claim functions.⁶ ID at 6. UEI bases its domestic industry on its own investments in the development, maintenance, improvement, and integration of its QuickSet software into the Samsung DI Products (televisions). *Id.* at 122-37.

⁶ UEI relies on certain remote control devices for its domestic industry with respect to the '642 patent, which is not presently at issue. *See* ID at 6, 24 (discussing Order No. 38 (Jan. 19, 2021), *unreviewed by Comm'n Notice* (Feb. 18, 2021)).

III. COMMISSION REVIEW OF THE FINAL ID

When the Commission reviews an initial determination, in whole or in part, it reviews the determination *de novo*. *Certain Soft-Edged Trampolines and Components Thereof*, Inv. No. 337-TA-908, Comm’n Op. at 4 (May 1, 2015). Upon review, the “Commission has ‘all the powers which it would have in making the initial determination,’ except where the issues are limited on notice or by rule.” *Certain Flash Memory Circuits & Prods. Containing Same*, Inv. No. 337-TA-382, USITC Pub. No. 3046, Comm’n Op. at 9–10 (July 1997) (quoting *Certain Acid-Washed Denim Garments & Accessories*, Inv. No. 337-TA-324, Comm’n Op. at 5 (Nov. 1992)). With respect to the issues under review, “the Commission may affirm, reverse, modify, set aside or remand for further proceedings, in whole or in part, the initial determination of the administrative law judge.” 19 C.F.R. § 210.45(c). The Commission also “may take no position on specific issues or portions of the initial determination,” and “may make any finding or conclusions that in its judgment are proper based on the record in the proceeding.” *Id.*; see also *Beloit Corp. v. Valmet Oy*, 742 F.2d 1421, 1423 (Fed. Cir. 1984).

IV. ANALYSIS

For the reasons set forth below, the Commission has determined to affirm the ID’s findings of infringement and validity of the ’196 patent, with some clarifications. The Commission also affirms the ID’s finding of no violation with respect to the ’317 patent, albeit with some modification to its finding that UEI satisfied the technical prong of the domestic industry requirement. The Commission takes no position on whether UEI satisfied the economic prong under Section 337(a)(3)(B) with respect to any of the asserted patents. The Commission determined not to review and thus adopted the ID’s findings that UEI satisfied the economic prong requirement with respect to all three patents under Section 337(a)(3)(C). See ID at 134-

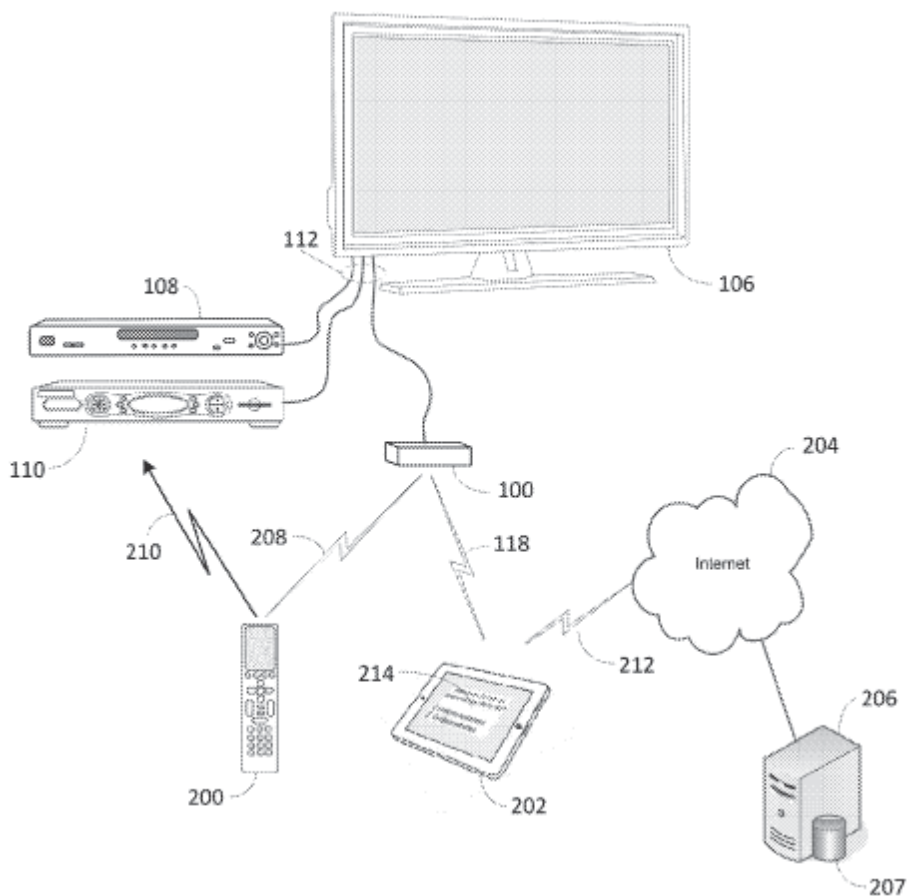
38; 86 Fed. Reg. at 51382. The Commission otherwise affirms and adopts the ID’s findings, conclusions, and supporting analyses that are not inconsistent with this opinion.

A. The ’196 Patent

The Commission determined to review all issues relating to the ’196 patent, including the construction and application of the term “for use in configuring the remote control device to transmit” in the final clause of claim 1, infringement, and invalidity. *See* Comm’n Notice, 86 Fed. Reg. at 51382 (Questions A-D). The Commission adopts the ID’s findings as to the ’196 patent not addressed below, including the ID’s finding that UEI has standing to assert the ’196 patent (ID at 86-88), that UEI has satisfied the technical prong of the domestic industry requirement (*id.* at 102-06), and that UEI has satisfied the economic prong of the domestic industry requirement under Section 337(a)(3)(C) with respect to the ’196 patent (*id.* at 134-37).

1. Background

The ’196 patent is directed to a hardware/software unit called a Universal Control Engine (“UCE”), which can identify and select the optimal communications pathway for transmitting command signals to control each target device, based on information about that device received from a remote control device. *See* ’196 patent at Abstract, 1:66-2:45, 4:15-20. For example, in Figure 2, below, the UCE (**100**) is a stand-alone device that can transmit consumer electronic control (“CEC”) commands over a high-definition multimedia interface (“HDMI”) connection to connected media devices, such as a television (**106**), or it can designate the remote control device (**200**) to transmit commands via infrared (“IR”) (**210**) or another wireless frequency to control other target devices, such as a DVD player (**108**) or DVR (**110**). *Id.* at 4:39-44, 6:62-7:4, Fig. 2.



'196 patent, Fig. 2. The UCE may be either a stand-alone device or it may be incorporated into a media device, such as a television. *Id.* at 2:46-55, 4:60-62, 5:7-12, Figs. 3, 4.

The claimed invention is directed to the set-up of the “first media device” (*e.g.*, UCE) and a remote control device for controlling a target device, such as a television or DVR. *See id.* at 17:1-32 (claim 1). After the user enters information identifying the type and brand of a target device (“second media device”), the remote control transmits “first data” to the UCE indicating whether that target device will be “responsive” or “unresponsive” to a “first command” (*e.g.*, a CEC command) sent over HDMI. *Id.* at 1:66-2:45, 3:42-4:59, 8:49-9:26. If the “first data” indicates that the target device will be responsive to commands sent over HDMI, then the “first media device” will be configured to transmit commands over HDMI to the target device. *See id.*

at 9:27-10:19, 11:40-55, Figs. 7, 9. This is referred to as the “responsive” case, as set forth in limitation 1[e][i] of claim 1, below. *See id.* at 17:13-21.

If, on the other hand, the “first data” indicates that the target device will not be responsive to a command sent over HDMI, then the UCE will transmit “second data” to the remote control “for use in configuring the remote control” to issue a command (*e.g.*, via IR) for directly controlling the target device. *See id.* at 11:28-38. This is the “unresponsive” case, as set forth in the final claim limitation 1[e][ii], below. *See id.* at 17:22-32 (limitation 1[e][ii]). As a result of the “responsive” and “unresponsive” cases, the system can be configured to control multiple devices using the most appropriate pathway for each device. *Id.* at Abstract, 2:7-45; ID at 91-92.

Claim 1 recites the following, with bracketed letters added to identify certain limitations, and the claim terms in dispute identified by italics:

1. [p] A first media device, comprising:

[a] a processing device;

[b] a high-definition multi-media interface [HDMI] communications port, coupled to the processing device, for communicatively connecting the first media device to a second media device;

[c] a transmitter, coupled to the processing device, for communicatively coupling the first media device to a remote control device; and

[d] a memory device, coupled to the processing device, having stored thereon processor executable instruction;

[e] wherein the instructions, when executed by the processing device,

[i] cause the first media device to be configured to transmit a first command directly to the second media device, via use of the high-definition multi-media [HDMI] communications port, to control an operational function of the second media device when a first data provided to the first media device indicates that the second media device will be responsive to the first command, and

[ii] cause the first media device to be configured *to transmit a second data to a remote control device*, via use of the transmitter, *for use in*

configuring the remote control device to transmit a second command directly to the second media device, via use of a communicative connection between the remote control device and the second media device, to control the operational function of the second media device when the first data provided to the first media device indicates that the second media device will be unresponsive to the first command.

'196 patent at 17:1-32 (bracketed letters, emphasis added).

2. Claim Construction

The parties' infringement dispute focuses primarily on limitation 1[e][ii], which states that if the "first data" indicates the target device ("second media device") will be "unresponsive" to a command sent via HDMI, then the "first media device" (*e.g.*, UCE) will transmit a "second data" to the remote control device "*for use in configuring the remote control device to transmit a second command*" to the target device for controlling that target device. *See* '196 patent at 17:22-32 (limitation 1[e][ii]) (emphasis added).

The parties did not seek a construction of "for use in configuring the remote control to transmit" during the *Markman* proceedings. *See* Order No. 24 (Oct. 1, 2020) (*Markman* order). The ALJ also did not provide a construction in either the *Markman* order or the ID, apart from applying that term according to its plain and ordinary meaning. *Id.*; ID at 86.

The ID addresses the term only as part of its infringement analysis, finding that "Roku mischaracterizes [claim 1's] requirements, and to the extent Roku's position implicates claim construction, its proposed construction is rejected." ID at 95. The ID finds no requirement that the "second data" must actually change the configuration, or settings, of the remote control, as Roku argued. *Id.* "It is enough that the second data is 'for use in configuring the remote control device,' to perform its particular operation," the ID finds. *Id.* at 95-96. The ID also finds it to be irrelevant whether additional data is communicated between the receipt of the "first data" and the transmission of the "second data," provided the "second data" is "for use in configuring the

remote control device” and “to control the operational function of the second media device.” *Id.* at 96 (discussing ’196 patent at 17:21-32).

The Commission asked the parties on review whether the term “for use in configuring the remote control device to transmit” requires construction and, if so, what construction should be adopted. Comm’n Notice, 86 Fed. Reg. at 51382 (Question A). UEI argued that the term does not require construction, as neither party identified it for construction during the *Markman* proceeding, and no party or expert has identified any special lexicography, disclaimer, or other evidence that would warrant departure from the term’s ordinary meaning. *See* UEI’s Resp. at 1-2. Roku argues that the term “for use in configuring the remote control” should be construed according to its plain and ordinary meaning to require that the “second data must be used in changing the settings of the remote control.” *See* Roku’s Resp. at 1-3.

On review of the parties’ briefs, the ID, and evidence of record, the Commission affirms the ID’s finding that “for use in configuring the remote control to transmit” should be understood and applied according to its plain and ordinary meaning in the art in the context of the patent’s intrinsic evidence, *i.e.*, its claim language, specification, and prosecution history. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-17 (Fed. Cir. 2005), *cert. denied*, 546 U.S. 1170 (2006). The Commission affirms the ID’s rejection of Roku’s attempt to narrow this term to mean the “second data” itself “must be used in changing the settings in the remote control.” *See* Roku’s Resp. at 1. There is nothing in the claim language or specification that requires the “second data” to change any settings or directly configure the remote control. In contrast, claim 1 states that the executed instructions must “*cause the first media device to be configured* to transmit” a “first command” or “second data,” respectively, in the “responsive” or “unresponsive case.” *See* ’196 patent at 17:14-16, 21-24 (emphasis added). The term “*for use in configuring*” is broader

than “*cause . . . to be configured*”; the term “for use in configuring” does not require the “second data” to directly or immediately change any settings or configuration of the remote control.

The parties have not identified, nor has the Commission found, any special definition or disclaimer in the intrinsic record of the ’196 patent that warrants departure from the term’s ordinary meaning. To the contrary, the specification says little about “configuring” the remote control device, apart from sending communications between the remote control and UCE. *See, e.g., id.* at 4:39-42, 4:62-5:2, 5:16-19, 6:17-22, 11:40-49. The specification also states that “the UCE may delegate the transmission of IR commands **210** to the remote control device **200**, *i.e.*, use remote control **200** as a *relay device* for those commands determined to be best executed via IR transmissions.” *Id.* at 4:44-50 (emphasis added). This passage makes no mention of “configuring” the remote control or changing its settings; it says only that the remote control may be used simply as a “relay device.” *See id.* To the extent this passage is relevant to claim 1, it does not require that the “second data” change any settings or configuration in the remote control, and thus does not support Roku’s more narrow construction.

The Commission also rejects Roku’s attempt to limit the scope of the claim term to a particular embodiment in related U.S. Patent Application Publication 13/198,072 (“the ’072 Application”) or dictionary definition. *See* Roku’s Resp. at 1-2. Roku has waived this argument by failing to raise it in its pre-hearing brief, post-hearing brief, or petition for review. *See* Order No. 2 (May 26, 2020) (Ground Rules 9.2, 13.1); 19 C.F.R. § 210.72 (Commission Rule 210.72).

Even if it were timely, Roku’s argument would fail on its merits. To the extent the ’196 patent mentions the ’072 Application, apart from a generic incorporation of this and other related applications (*see* ’196 patent at 1:28-32), the specification refers only to the teachings of the ’072 Application about scanning HDMI appliances to identify those that are CEC compatible (*id.* at

14:21-29). The passage Roku actually quotes to support its position, however, does not address such scanning but states only that the remote control device “may be configured” to include storing a pointer or downloading data from a remote server. The ’072 Application does not refer to data “for use in configuring” the remote control. *See* Roku’s Resp. at 2 (citing ’072 Application, ¶ 19). Thus, the intrinsic record does not show that a person skilled in the art would interpret the term “for use in configuring the remote control” as narrowly as Roku argues.

The Commission thus adopts the ID’s findings regarding construing and applying the term “for use in configuring the remote control device to transmit” according to its plain and ordinary meaning. The “second data” must be used in the process of configuring the remote control, but it does not need to actually or directly change any settings in the remote control, as the ID correctly finds. ID at 92-98.

3. Infringement

The Commission asked the parties whether, in view of their response to Question (A), above, the accused Roku products infringe claim 1 of the ’196 patent. *See* Comm’n Notice, 86 Fed. Reg. at 51382 (Question (B)). The Commission has determined on review to affirm the ID’s finding that the Roku Ultra and Soundbar products infringe the ’196 patent.⁷

a. Legal Standard

Section 337 prohibits “the importation into the United States, the sale for importation, or the sale within the United States after importation . . . of articles that infringe a valid and enforceable United States patent” 19 U.S.C. § 1337(a)(1)(B). Direct infringement includes

⁷ This section addresses only the original versions of the accused Roku Ultra and Soundbar products, currently in dispute. *See* ID at 6-7. The Commission affirms the ID’s findings that the revised Roku Ultra and Soundbar products do not infringe the ’196 patent. *See id.* at 98-102.

making, using, offering to sell, or selling a patented invention or importing a patented invention into the United States, without consent of the patent owner. 35 U.S.C. § 271(a).

To prove direct infringement, the plaintiff must establish by a preponderance of the evidence that one or more claims of the asserted patent read on the accused product or process, either literally or under the doctrine of equivalents.⁸ *Advanced Cardiovascular Sys., Inc. v. Scimed Life Sys., Inc.*, 261 F.3d 1329, 1336 (Fed. Cir. 2001). Each limitation in a patent claim is considered material and essential to an infringement determination. *See London v. Carson Pirie Scott & Co.*, 946 F.2d 1534, 1538 (Fed. Cir. 1991). “Literal infringement of a claim exists when each of the claim limitations reads on, or in other words is found in, the accused device.” *Allen Eng. Corp. v. Bartell Indus.*, 299 F.3d 1336, 1345 (Fed. Cir. 2002). If any claim limitation is found to be absent from the accused product or process, then there is no literal infringement. *Bayer AG v. Elan Pharm. Research Corp.*, 212 F.3d 141, 1247 (Fed. Cir. 2000).

b. The Accused Roku Products

The ID finds that the accused Roku Ultra and Roku Soundbar are each media streaming devices (“first media device”) with a processor (“processing device”), a “memory device” coupled to the processor for storing “executable instructions,” an HDMI port coupled to the processor for communicating with a target device (“second media device”), and a “transmitter” coupled to the processor for communicating with a “remote control device.” *See* ID at 92-93.

The ID finds that during set-up, the Roku device transmits a CEC command over HDMI (*i.e.*, to mute the television or to turn it off) and queries the user to confirm whether that CEC command has been successful (*i.e.*, “is the television muted?” or “is the television off?”). *Id.* at 93. If the user confirms the HDMI/CEC test command was successful (*i.e.*, the television is

⁸ The doctrine of equivalents is not at issue here.

mute or off), then the accused Roku device is configured to transmit CEC commands directly to the television via the HDMI connection. *Id.* at 93, 95.

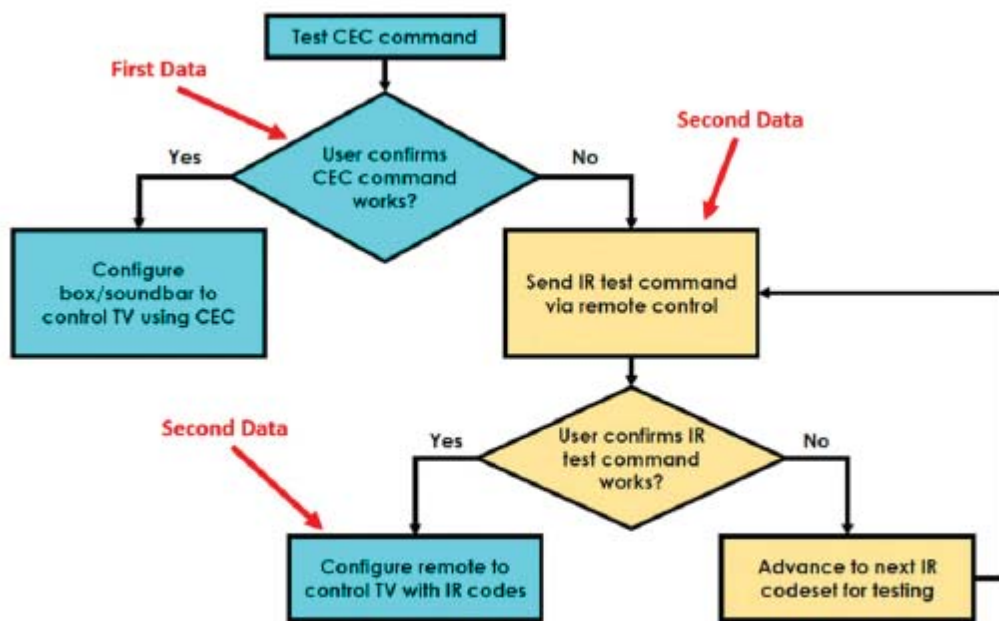
If, on the other hand, the user responds that the HDMI/CEC test command was not successful (*i.e.*, the television was not muted or turned off), then the accused Roku devices will send test codes to the remote control for sending IR commands from the remote control to directly control the television. *Id.* at 93-94. The process is iterative, the ID explains, in that the accused Roku devices may send multiple code sets successively until it identifies the code set that will effectively control the target television, the user abandons the process, or the user starts over by identifying a different brand of television. *Id.* at 94. Roku acknowledges that the successful IR code set, whether identified the first time or after multiple tries, “is for use in configuring the remote control” because it is stored in the settings of the remote control and is used to generate all subsequent transmissions of IR commands. Roku’s Resp. at 5-6.

c. Analysis

The Commission affirms the ID’s finding that the accused Roku Ultra and Soundbar products infringe independent claim 1 and dependent claims 3, 11, and 13-15 of the ’196 patent. ID at 98. There is no dispute that the accused Roku products satisfy the hardware limitations of claim 1 (the preamble and limitations [a]-[d]), for the reasons given in the ID. *Id.* at 92-93.

The ID also properly finds that the user’s response (yes or no) to the query from the accused Roku device (*i.e.*, “is the television muted?” or “is the television off?”) corresponds to the “first data” in claim 1. ID at 93, 95. The ID’s application of this term is consistent with the specification, which describes the invention in terms of a flowchart, wherein the user is prompted to respond to various inquiries in the flowchart’s decision tree. *See, e.g.*, ’196 patent at 9:46-53 (soliciting user’s responses to certain effects-observable commands during testing **920** in Fig. 9), 15:57-63 (soliciting user’s responses during testing **1528** in Fig. 15).

The Commission also affirms the ID’s finding that the accused Roku products practice the “responsive” part of limitation 1[e][i]. *See* ID at 92-98. If the user responds affirmatively (“first data”) that the HDMI/CEC test command was successful (*e.g.*, television is muted or turned off), then the accused Roku device (“first media device”) is configured to transmit commands (“first command”) to the television (“second media device”) via the HDMI connection, as required by limitation 1[e][i]. *See id.* at 92-95 (applying ’196 patent at 17:14-21 (limitation 1[e][i])). This “responsive” part is depicted on the left side of the flowchart below (starting with “yes” to “User confirms CEC command works?”):



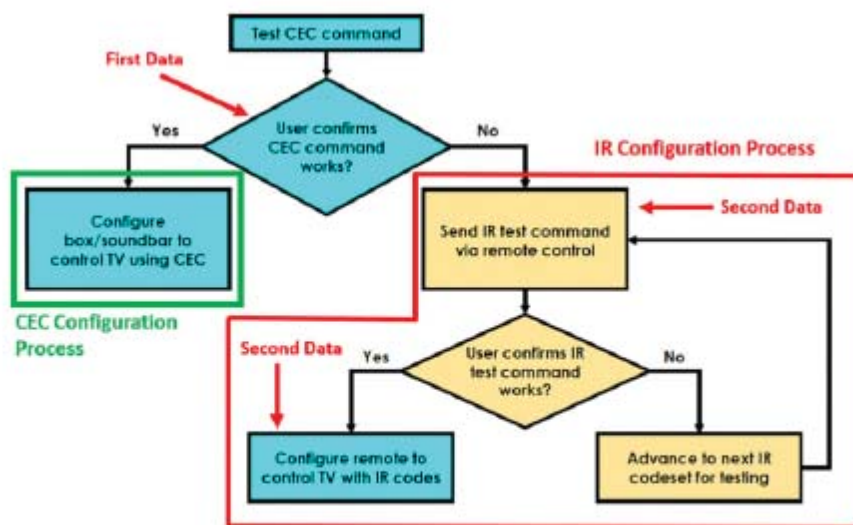
(RDX-0007C.21 (annotated).)

UEI’s Resp. at 8. This flowchart was initially prepared as a demonstrative (RDX-0007C.21) for Roku’s expert, Mr. Lipoff, and was later annotated in red by UEI to identify the “first data” and “second data” of claim 1 in the Roku Soundbar and Ultra devices. *Id.*; Roku’s Resp. at 7 (citing Hr’g Tr. (Lipoff) at 549:15-550:13, 553:13-554:18; Tr. (Peters) at 470:20-471:1).

The Commission also affirms the ID’s finding that the accused Roku products practice the “unresponsive” part of limitation 1[e][ii]. *See* ID at 95-98. Referring again to the flowchart above, the “unresponsive” portion corresponds to the right-side branch (“no”) after the “first data” (“User confirms CEC command works?”). UEI identifies two candidates for the “second data,” marked in red above. *See* UEI’s Resp. at 3, 5-8. If the target device is “unresponsive” to the CEC test command, the Roku Ultra or Soundbar device transmits an RF signal (the initial “second data”) to the remote control device that contains the parameters for an IR test command. *See id.* at 4. Roku acknowledges that the remote control device extracts those parameters and uses them to generate and transmit a corresponding IR signal. Roku’s Resp. at 5-6 (citing Hr’g Tr. (Lipoff) at 551:12-553:12; Hr’g Tr. (Peters) at 60:18-61:11, 469:13-470:13); Hr’g Tr. (Rosenberg) at 136:20-137:13). Roku argues, however, that this RF signal is not “for use in configuring the remote control” because it is not stored in the remote control and does not change its settings, but only passes through it like “water through a pipe.” *See id.*

UEI’s second candidate for the “second data” is the final IR configuration data that the Roku Ultra or Soundbar device transmits to the remote control after the user confirms that an IR test command successfully controls the target television. *See id.* at 6; UEI’s Resp. at 6-8. Roku acknowledges that this latter “second data” is “for use in configuring the remote control” because it is stored in the settings of the remote control and used to generate all subsequent transmissions of IR commands. Roku’s Resp. at 5-6 (citing Hr’g Tr. (Lipoff) at 553:13-554:18; Hr’g Tr. (Peters) at 470:14-471:1); Roku’s Reply at 5 (citing Hr’g Tr. (Mendenhall) at 522:12-523:4). Nonetheless, Roku argues that this IR configuration data does not satisfy the “second data” limitations in claim 1 because it is not “based on” the “first data.” *See* Roku’s Resp. at 5-6; Roku’s Reply at 4-5.

The Commission finds it unnecessary to divide the “unresponsive” branch, above, into two parts for purposes of infringement. As shown below, the entire right-side branch of the flowchart describes the process of configuring the remote control to transmit IR commands (“second command”) using an appropriate IR code set, regardless of whether the operative IR code set is identified after testing only one IR test command or multiple IR test commands in succession (as represented by the feedback loop at right). *See* ID at 98 (citing Hr’g Tr. (Rosenberg) at 137:11-13); *see also* Hr’g Tr. (Rosenberg) at 112:21-113:23, 203:4-23.



(RDX-0007C.21 (annotated).)

UEI’s Reply at 10 (original demonstrative by Roku; annotations added by UEI).

Limitation 1[e][ii] does not require that the “second data” directly or immediately result in the successful configuration of the remote control to transmit a “second command” (*e.g.*, via IR) for controlling the target device (“second media device”). *See* ’196 patent at 17:21-32; ID at 95-96. Nor does limitation 1[e][ii] preclude transmitting additional data or commands between the “second data” and the ultimate configuration of the remote control to transmit a “second command” for controlling the target device, as long as the “second data” is “*for use in*

configuring the remote control” to ultimately transmit a “second command” to control the target device. ID at 96, 98. There is also no merit to Roku’s argument that the “second data,” “second command,” or configuration of the remote control must be “based on” the “first data,” as there is no such requirement in the claim. *See* ’196 patent at 17:13-32.

Accordingly, the Commission finds that the initial RF signal, which contains the parameters for generating the initial IR test command, corresponds to the “second data” in limitation 1[e][ii]. The remote control extracts those parameters and uses them to generate and transmit the IR test signal that is part of the configuration process, as Roku acknowledges. Roku’s Resp. at 5-6 (citing Hr’g Tr. (Lipoff) at 551:12-553:12; Hr’g Tr. (Peters) 469:13-470:13). This “second data” is sufficient to satisfy the limitation “for use in configuring the remote control” because the initial RF signal is used the process of configuring the accused remote control devices, specifically in identifying the appropriate IR code set, which is then loaded, stored, and used to configure the remote control, regardless of whether that IR code set was identified after testing the initial IR test command or multiple IR test commands, as needed. *Id.*

The Commission thus finds that the initial RF signal used to generate the IR test command is the “second data” that is “for use in configuring the remote control to transmit a second command” for directly controlling the target device, as set forth in limitation 1[e][ii]. The Commission affirms the ID’s findings that the accused Roku products infringe claim 1 and the asserted dependent claims of the ’196 patent. ID at 92-98, 101-02, 137.

The Commission recognizes that the ID’s finding of infringement rests on resolving the parties’ dispute as to whether “tak[ing] the RF coming from the Roku Box, converting it to IR, and then sending it back down” (*i.e.*, sending the IR test command from the remote control to the target device for testing) qualifies as “configuring” the remote control. *See* ID at 97-98 (quoting

Hr’g Tr. (Lipoff) at 553:12-21)). Although the Commission’s analysis above is sufficient to conclude that limitation 1[e] is satisfied, the Commission further affirms the ID’s finding that “converting” the RF signal to IR (in Roku’s terms) and transmitting that IR signal to the target device also satisfies this claim limitation, even under Roku’s narrow interpretation of “for use in configuring.” Some internal “settings” must be changed, even temporarily, within the remote control to cause it to receive an RF signal, extract the appropriate parameters from it, use them to generate a specific IR test command, and then transmit that IR test command to the television. *See* Roku’s Resp. at 3, 5-6. In other words, changing the remote control’s settings to receive an RF signal, deconstruct it, and use its parameters to generate and transmit a new signal in a different format (IR) is more complicated than “water flowing through a pipe,” as Roku contends. These changes are thus sufficient to amount to “configuring” the remote control, even temporarily, in the context of claim 1. *See* ID at 96-97 (quoting Hr’g Tr. (Rosenberg) at 209:12-21); *see also* Roku’s Resp. at 5.

In sum, the Commission affirms the ID’s finding that the Roku Ultra and Soundbar products infringe claims 1, 3, 11, and 13-15 of the ’196 patent. ID at 92-98, 101-02, 137.

4. Validity

The Commission also determined to review the ID’s findings on validity, specifically, whether the asserted claims of the ’196 are obvious over Chardon (U.S. Patent Appl. Pub. No. 2012/0249890) in combination with Mishra (U.S. Patent Appl. Publ. No. 2001/0005197). *See* 86 Fed. Reg. at 51382 (Questions C, D). ID at 106-121. Upon review of the prior art, the ID, the parties’ submissions, and evidence of record, the Commission has determined to affirm, with some modification, the ID’s finding that Roku failed to prove by clear and convincing evidence that the asserted claims are invalid as obvious over Chardon in combination with Misha.

a. Legal Standard

A party cannot be held liable for infringement if the asserted patent claim is invalid. *See Pandrol USA, LP v. AirBoss Railway Prods., Inc.*, 320 F.3d 1354, 1365 (Fed. Cir. 2003). Patent claims are presumed valid (35 U.S.C. § 282), so a party challenging validity must present “clear and convincing evidence” of invalidity to overcome this statutory presumption. *Checkpoint Systems, Inc. v. Int’l Trade Comm’n*, 54 F.3d 756, 761 (Fed. Cir. 1995).

A patent is invalid as obvious if “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” 35 U.S.C. § 103 (pre-AIA). Obviousness is a legal conclusion that is based on underlying findings of fact. *Motorola Mobility, LLC v. Int’l Trade Comm’n*, 737 F.3d 1345, 1348 (Fed. Cir. 2013). These factual findings, known as the *Graham* factors, are: (1) the scope and content of the prior art; (2) the difference between the prior art and the claims at issue; (3) the level of ordinary skill in the art at the time the invention was made; and (4) any objective indicia of non-obviousness. *Id.* (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966)). All four *Graham* factors must be considered where evidence is offered, and it is error to reach a conclusion of obviousness until all of those factors are considered. *Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1071-72 (Fed. Cir. 2018).

A party challenging a patent as obvious through a combination of references must also demonstrate by clear and convincing evidence that a person of ordinary skill in the art would have been motivated to combine the teachings of the prior art to achieve the claimed invention and would have had a reasonable expectation of success in doing so. *OSRAM Sylvania, Inc. v. Am. Induction Techs., Inc.*, 701 F.3d 698, 706-707 (Fed. Cir. 2012). A flexible teaching, suggestion, or motivation test can be useful to prevent hindsight bias when determining whether

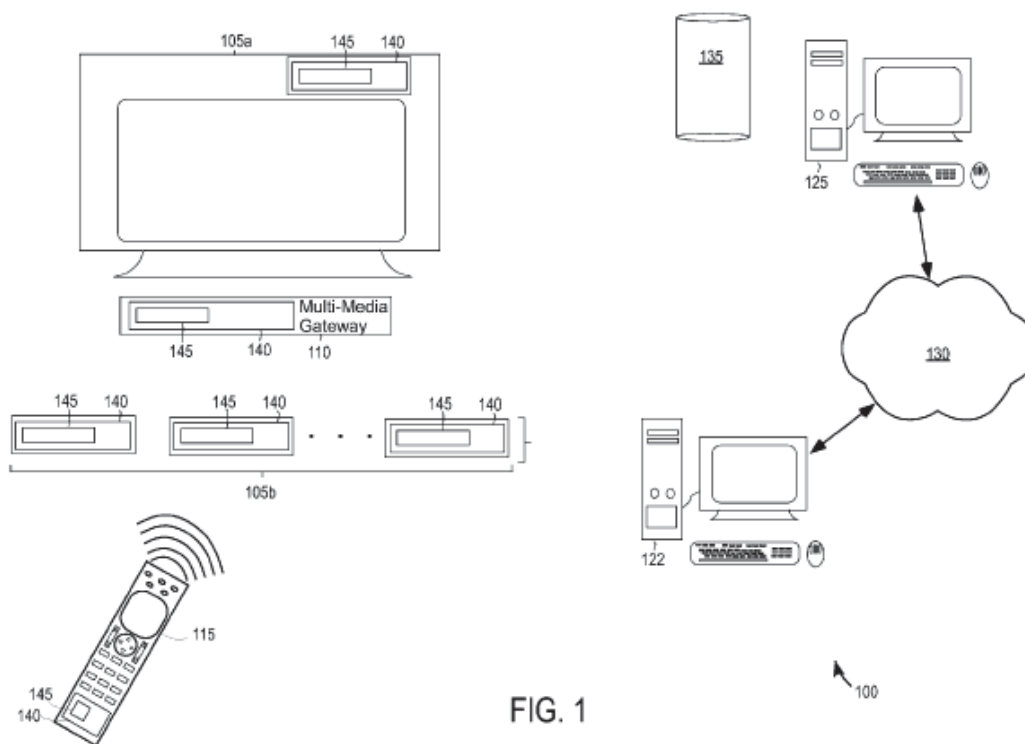
a combination of known elements would have been obvious. *Norgren Inc. v. Int’l Trade Comm’n*, 699 F.3d 1317, 1322-23 (Fed. Cir. 2012). Obviousness, however, cannot be confined to a rigid application of a teaching, suggestion, or motivation test, however, as consideration of the common sense and ordinary creativity of one of ordinary skill in the art must also be part of the analysis. *Id.* (discussing *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 419-21 (2007)). Even so, the party asserting obviousness must still show there was an apparent reason or motivation to combine the known elements in the fashion claimed by the patent at issue. *See KSR*, 550 U.S. at 418-19.

When a patent is being challenged for obviousness, a patentee may respond by presenting evidence of “objective indicia” (or “secondary considerations”) of non-obviousness, such as the commercial success of the invention, long-felt but unmet need for the solution it provides, failure of others to achieve the invention, praise of the invention, or copying by others. *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1372-73 (Fed. Cir. 2019) (citing *inter alia Graham*, 383 U.S. at 17-18). The patentee must also demonstrate that there is a “nexus,” *i.e.*, a legally and factually sufficient connection, between the objective indicia and the merits of the invention. *Id.* at 1373. A rebuttable presumption of a nexus exists if the patentee can show that the objective evidence is tied to a specific product that is the invention disclosed and claimed in the patent. *Id.*; *Immunex Corp. v Sandoz, Inc.*, 964 F.3d 1049, 1067 (Fed. Cir. 2020). Such a showing is not required, however, as the patentee may prove a nexus by showing that the objective indicia, if any, are the direct result of the unique characteristics of the claimed invention. *Fox Factory*, 944 F.3d at 1373. However, where the secondary considerations “actually result from something other than what is both claimed and novel in the claim, there is no nexus to the merits of the claimed invention.” *In re Huai-Hung Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011).

b. The ID

Chardon. Chardon, Roku’s primary prior art reference, is directed to a “remote control system” (**140**) for identifying and selecting the most appropriate control codes (*e.g.*, HDMI/CEC or wireless IR) for controlling the media devices in a home entertainment system (**100**).

Chardon, ¶¶ 1-3, 5, 6. In Figure 1, below, a remote control system (**140**) with a software component known as a remote control engine (**145**), is installed on each media device, such as a “multi-media gateway” (**110**), a remote control device (**115**), an HDMI display (*e.g.*, television) (**105a**), and other media devices (**105b**). *Id.*, ¶¶ 8, 32, 39-40, 88.



The ID identifies Chardon’s “multi-media gateway” as the “first media device” in claim 1 because it includes a processor (“processing device”), transceivers, memory (“memory device”), and a CEC bus (“HDMI port”). ID at 109-10. The multi-media gateway (**110**) serves as a bridge for receiving command codes (*e.g.*, IR) from a remote control device (**115**), translating those

command codes from one medium to another medium (*e.g.*, IR to CEC or RF), as necessary, and then transmitting the codes to the target device (“second media device”). Chardon, ¶¶ 1, 29-31. The ID finds that Chardon satisfies the hardware limitations 1[a]-[d] in claim 1. ID at 113-14.

The ID also finds that Chardon discloses the “responsive” part in limitation 1[e][i]. *Id.* Chardon discloses two ways in which the “remote control system” chooses between CEC and IR codes. *Id.* at 107; Chardon, ¶¶ 12, 14, Fig. 5. The first way involves monitoring a CEC bus to determine whether the target HDMI device responds to a CEC test command, and if it does not, determining a corresponding IR command code, transmitting it to the target device, and storing the appropriate CEC or IR codes for future use in controlling that device. ID at 107-08, 112-13 (citing Chardon, ¶¶ 14, 20, 33-34, 58-59, 68). In the second way, the remote control system uses identifying information (*e.g.*, an Extended Display Identification Data Standard or a CEC vendor ID) to determine whether or not the target device will be responsive to specific CEC commands, and then transmits commands via CEC or IR, accordingly. ID at 108, 112-13 (citing Chardon, ¶¶ 10-12, 20, 49, 50, 59, 62).

Roku admits, and the ID agrees, that Chardon does not disclose the “unresponsive” part in limitation 1[e][ii]. *See* ID at 113; Roku’s Resp. at 11-12. Each of Chardon’s embodiments, the ID finds, uses either the multi-media gateway or the remote control, but not both, to issue commands for controlling the target device. ID at 114-15. Even though Chardon discloses a remote control (**115**) that may be configured to transmit and receive command codes, Chardon’s multi-media gateway sends IR codes directly to the target device and does not transmit them to the remote control for configuring that remote control. *Id.* at 113 (citing Chardon, ¶¶ 38-40). Furthermore, Chardon does not disclose an embodiment that selects between two devices (*e.g.*, the multi-media gateway or the remote control) to transmit commands to different target devices,

nor does it make any such selection based on the same “first data,” as in claim 1 of the ’196 patent. *Id.* at 111-13 (citing Chardon, ¶¶ 5, 38-40); Hr’g Tr. (Rosenberg) at 1239:7-19. Thus, the ID finds, and Roku agrees, that Chardon fails to disclose a “first media device” that “transmit[s] a second data to a remote control device, via use of a transmitter, for use in configuring the remote control device to transmit a second command directly to the second media device,” as in limitation 1[e][ii]. *Id.* at 113; Roku’s Resp. at 11-12.

Mishra. The ID finds that Mishra discloses the elements that are missing from Chardon. Mishra discloses an embodiment in which a set top box (**12**) sends codes and protocols to a remote control, either all at once or on an as-needed basis, which the remote control uses for controlling home theater devices. Mishra, ¶¶ 37-39. The ID finds that Mishra thus discloses a transmitter for transmitting “second data” from a “first media device” (set top box) to a remote control, which may receive that second data and uses it to transmit a “second command” directly to a target device (“second media device”). *See* ID at 114-15.

Combination of Chardon and Mishra. The ID finds that a skilled artisan would have been capable of adding Mishra’s transmitter and remote control to Chardon. ID at 115. The ID further accepts Roku’s argument that a person skilled in the art would have been motivated to combine Chardon with Mishra to address purportedly known “problems” with Chardon’s “IR blasters” by replacing those IR blasters with Mishra’s remote control to directly control the target device. *Id.* The ID concludes that Roku established a *prima facie* case of obviousness, albeit a “marginal” one, due to the relatively “substantial” differences between the prior art and the claimed invention, and the need to engage in “a certain amount of cherry-picking” to identify the claim elements in each prior art reference. *See* ID at 114-16.

Nonetheless, the ID finds UEI's evidence of objective indicia of non-obviousness is "substantial; indeed they are dispositive," and outweighs Roku's "marginal" *prima facie* case of obviousness. ID at 116. The ID concludes that Roku failed to prove by clear and convincing evidence that the '196 patent claims are invalid as obvious. *Id.* at 118, 137-38.

c. Analysis

The Commission affirms the ID's finding that Roku failed to prove by clear and convincing evidence that the '196 patent claims are obvious over Chardon combined with Mishra, including its finding that UEI's secondary considerations of non-obviousness are "substantial" and "dispositive." *See* ID at 116-18, 138. The Commission writes separately, however, to reverse the ID's finding that Roku made a *prima facie* showing of obviousness. *Id.* at 116, 118.

The ID acknowledges that a "certain amount of cherry-picking is required" to find the limitations of claim 1 in either Chardon or Mishra because the references are "not especially analogous to the '196 patent" and the differences between the claimed invention and the prior art are "substantial." *See id.* at 114-15. In particular, neither Chardon nor Mishra discloses the "fundamental tenet" of the '196 patent's invention, namely, a system configured to choose between two different control devices to transit commands over different pathways (e.g., HDMI vs. IR) to different target devices, based on whether the "first media device" determines that the target device will be responsive or unresponsive to the "first command" over HDMI. *See* '196 patent at 4:39-40, 17:14-32 (limitation 1[e]); Hr'g Tr. (Rosenberg) at 1218:21-1219:8, 1224:24-1225:5, 1226:6-24, 1239:7-19. Also, neither Chardon nor Mishra discloses transmitting "second data" to the remote control "for use in configuring the remote control device to transmit" commands in the manner set forth in limitation 1[e]. *See* Hr'g Tr. (Russ) at 938:10-24; ID at 110, 113-14, 118. Mishra also does not disclose using an HDMI connection. ID at 115.

The Commission further finds that combining Chardon with Mishra does not involve a simple substitution of known elements, as Roku argues. Roku identifies no teaching, suggestion, or motivation in Chardon or Mishra to divide control of the target devices between two different control devices, as it would run contrary to Chardon’s teaching that either the multi-media gateway or the remote control, but not both, is used to control all of the target devices. *See, e.g.,* Chardon, ¶¶ 32, 38, 43-44; ID at 111, 114; Hr’g Tr. (Russ) at 935:9-936:25. Moreover, Chardon’s remote control engine can already control the target device over HDMI/CEC or IR (or another pathway), so it would be “duplicative” and “wasteful” to add a second IR command path that involves the remote control. *See* Hr’g Tr. (Rosenberg) at 1240:20-1241:1.

The Commission also finds that Roku’s evidence of alleged problems with IR blasters does not suffice to show that a person skilled in the art would have been motivated to combine Chardon and Mishra in the manner required to render the invention obvious. Roku, citing its expert Dr. Russ, argues that IR blasters have certain “limitations,” such as being difficult to line up effectively or connect inside an entertainment cabinet. *See* Roku’s Resp. at 17 (citing, *e.g.,* Hr’g Tr. (Russ) at 832:16-833:2, 945:7-18). Yet Dr. Russ testified that IR blasters also have “some advantages,” and indicated that their alleged problems can be alleviated by arranging the media devices in a proper way or through other means. *See* Hr’g Tr. (Russ) at 940:5-941:7. The Commission also finds no evidence to suggest that the alleged problems with IR blasters would have motivated a person skilled in the art to replace the single control device disclosed in Chardon with a more complicated system that uses two controlling devices (*e.g.,* a set top box and a remote control) to control different media devices, particularly where both devices are selected according to the same “first data,” as in claim 1.

For these reasons, the Commission finds that Roku has not established even a “marginal” *prima facie* case for obviousness and reverses the ID on that point. *See* ID at 116, 118. The Commission also finds that UEI’s evidence of secondary considerations is even more “substantial,” “impressive,” or “dispositive” than the ID recognizes. *See id.* at 116-18. This evidence, which includes industry praise for the invention and widespread adoption, identifies the use of two controlling devices (such as a set top box and a separate remote control) and thus exhibits a clear nexus between the invention and the secondary considerations, for the reasons stated in the ID. *See id.* at 116-17. UEI is also entitled to a presumption of a nexus because it has shown that this objective evidence is tied to specific Samsung products that practice the invention disclosed and claimed in the ’196 patent. *See Immunex Corp. v Sandoz, Inc.*, 964 F.3d 1049, 1067 (Fed. Cir. 2020). Roku has not overcome this presumption, made a *prima facie* showing of obviousness, or dispelled UEI’s substantive evidence of secondary considerations.

The Commission thus affirms the ID’s conclusion that Roku failed to prove by clear and convincing evidence that the ’196 patent claims are invalid as obvious, albeit it reverses the ID’s finding that Roku made even a *prima facie* showing of obviousness.

B. The ’317 Patent

The Commission adopted the ID’s findings that there is no violation of Section 337 with respect to the ’317 patent because the asserted claims are invalid as anticipated, obvious, and directed to patent-ineligible abstract subject matter, pursuant to 35 U.S.C. §§ 101-103. ID at 36-50, 57-83, 138-39. Nonetheless, the Commission determined to review the ID’s finding that UEI satisfies the technical prong of the domestic industry requirement with respect to the ’317 patent to correct an item in the ID’s analysis. *Id.* at 51-57.

1. Legal Standard

When a Section 337 investigation is based on allegations of patent infringement, the complainant must show that “an industry in the United States, relating to the articles protected by the patent . . . exists or is in the process of being established.” 19 U.S.C. § 1337(a)(2). “[A]n industry is considered to exist if there is in the United States, with respect to the articles protected by the patent . . . concerned –

(A) significant investment in plant and equipment;

(B) significant employment of labor or capital; or

(C) substantial investment in its exploitation, including engineering, research and development, or licensing.” 19 U.S.C. § 1337(a)(3).

The “domestic industry requirement” consists of a so-called “technical prong” and an “economic prong.” A complainant satisfies the technical prong by showing it is practicing, licensing, or otherwise exploiting the patents at issue. *Certain Microsphere Adhesives, Process for Making Same and Products Containing Same, Including Self-Stick Repositionable Notes*, Inv. No. 337-TA-366, Comm’n Op. at 8 (Jan. 16, 1996). The test for “practicing” a patent is essentially the same as it is for infringement, only it involves comparing the complainant’s own “domestic industry products” to one or more claims of the patent. *Alloc, Inc. v. Int’l Trade Comm’n*, 342 F.3d 1361, 1375 (Fed. Cir. 2003). It is sufficient that the domestic industry product practices at least one claim of each patent that serves as a basis for relief; it is not necessary for the complainant to practice the same claims it is asserting against the respondent. *Certain Male Prophylactic Devices*, Inv. No. 337-TA-546, Comm’n Op. at 38 (Aug. 1, 2007).

2. The ID

The ’317 patent is directed to a system for setting up a universal remote control device by using an interactive instruction set and controllable appliance, such as a set top box. ’317 patent

at Abstract, 3:3-5, 4:55-6:28, Figs. 5, 7. In pertinent part, the ID finds that UEI satisfies the technical prong of the domestic industry requirement by relying on certain Samsung televisions (“Samsung DI Products”) that incorporate and use UEI’s QuickSet software. *See* ID at 51-53.

The “primary dispute,” the ID explains, is whether the Samsung DI Products satisfy limitation 1[b], which requires “a transmitter for transmitting communications to a display device coupled to the controlled device.” ID at 54. UEI identified the Samsung television as the “controlled device” and its internal LCD panel as the “display device.” *Id.* Roku, however, argued that the internal LCD panel cannot be “coupled to the controlled device” (television) because “a part of something is not ‘coupled to’ the whole.” *Id.* (citing *inter alia Cutsforth, Inc. v. Motivepower, Inc.*, 643 F. App’x 1008, 1012 (Fed. Cir. Apr. 6, 2016) (non-precedential)).

The ID make two alternative findings. First, the ID finds that even if the “controlled device” must be physically separate from the “display device,” as Roku argues, then claim 1 is satisfied by identifying the “main board” in the Samsung DI Products as the “controlled device,” and the LCD panel as the “display device.” ID at 55-56. The ID finds that the main board is “a distinct component or set of components inside the Samsung RU8000 [television] that is physically separate from the LCD display panel” and “electrically connected to [*i.e.*, “coupled to”] the display panel,” as shown in the figures below. *Id.* The ID finds the main board also includes a “transmitter for sending display signals to the display panel,” as required by claim 1.



ID at 55 (reproducing CX-0647C.1).

Second, the ID finds that the '317 patent expressly states that the claimed invention may be contained within the same housing as the display device, as in a television, and does not necessarily have to be a stand-alone device. *See id.* at 56 (citing '317 patent at 8:39-44). The ID finds that in this context, then, the “display device” may be “coupled to” the television, and thus the Samsung DI Products satisfy limitation 1[b] under either interpretation. *Id.* at 56-57. The ID thus rejects Roku’s argument that, if the “controlled device” is the television, the “display device” cannot be part of the “controlled device” (television). *Id.* at 56.

Roku argues that the ID errs in finding that the LCD panel can be “coupled to” the Samsung television under either theory. First, Roku argues that the ID errs in finding that limitation 1[b] can be satisfied by identifying the main board as the “controlled device” because the main board does not have “a receiver for receiving communications from a remotely located controlling device,” as required by claim 1. *See Roku’s Resp.* at 20. Second, Roku reiterates that the LCD panel cannot be “coupled to” the television that contains that panel. *See id.*

3. Analysis

The Commission has reviewed the ID’s findings as to whether the Samsung DI Products practice claim 1 of the '317 patent, focusing on the term “coupled to” and the proper identification of the hardware limitations in the Samsung DI Products. *See* 86 Fed. Reg. at

51383 (Question E). Upon review of the ID and the parties' submissions, the Commission adopts the ID's conclusion, but modifies certain findings. *See* ID at 55-56.

There is no dispute that the Samsung DI Products contain each of the hardware components recited in the asserted claims (*e.g.*, a “receiver,” “remotely located controlling device,” “transmitter,” “display device,” “processing device,” “memory,” etc.) and use the QuickSet software to perform the claimed functionalities. *See* ID at 53-54, 56-57. The only question is whether they can be properly aligned with the limitations as needed to satisfy claim 1.

The Commission finds the parties have not disputed the meaning of “device” or sought to impose any specific or narrowing constructions on that term. The ordinary meaning of “device,” as used in claim 1 (*e.g.*, “controlled *device*,” “controlling *device*,” “display *device*,” “processing *device*,” etc.), has a broad and flexible scope. The Commission further notes that Roku has not objected conceptually to identifying a component, such as the main board, as the “controlled device,” other than to argue that it does not satisfy all the applicable limitations of claim 1.

In this context, then, the Commission finds that UEI correctly proposes that the LCD screen could be identified as the “display device” and the main board plus Bluetooth transceiver (“receiver”) could be the “controlled device.” *See* UEI's Reply at 22-23; UEI's Resp. at 20-22. Alternatively, the LCD screen could be identified as the “display device” and the rest of the Samsung television, including the main board, transceiver, and all other components, as the “controlled device,” given the breadth of the term “device.” Thus, there are multiple ways in which the Samsung DI Products can satisfy limitation 1[b] and all other limitations needed to practice claim 1.

As for the “coupled to” limitation, the Commission recognizes that terms like “coupled to” may be construed in certain contexts to require that the coupled components are separate

components. *See, e.g., Certain Collapsible and Portable Furniture*, Inv. No. 337-TA-1178, Comm’n Op., 2021 WL 2010902 at *13 n.13 (USITC May 18, 2021) (collecting cases). Nonetheless, the ID properly finds in this case that the ’317 patent teaches that the claimed invention (the “controlled device”) may be implemented as either a stand-alone set top box or integrated into a television or other media device. ID at 55-56 (citing ’317 patent at 8:39-48). Dependent claim 2, for example, is limited to a “controlled device compris[ing] a set-top box and the display device compris[ing] a television.” *See* ’317 patent at 9:12-14. This means that claim 1, as the independent claim, should be construed more broadly to cover both embodiments, in which the “controlled device” can be either a set top box or integrated into the target device. *See Eko Brands, LLC v. Adrian Rivera Maynez Enterprises, Inc.*, 946 F.3d 1367, 1373 (Fed. Cir. 2020) (construing a claim to exclude a preferred embodiment is rarely, if ever correct, and would require highly persuasive evidentiary support). In this context, the Commission finds that the intrinsic evidence shows that an internal “display device” (LCD panel) may be “coupled to” to the television containing the invention for purposes of practicing claim 1, as UEI argued. *See* UEI’s Resp. at 20; UEI’s Reply at 21-23.

The Commission thus affirms the ID’s findings that the Samsung DI Products, which contain UEI’s QuickSet software, practice the asserted claims of the ’317 patent. UEI thus satisfies the technical prong of the domestic industry requirement with respect to this patent.

C. Domestic Industry: Economic Prong

The Commission determined to review the ID’s finding that UEI satisfied the economic prong of the domestic industry requirement under Section 337(a)(3)(B) with respect to the ’196 and ’317 patents, 86 Fed. Reg. at 51382 (Question F), as well as the ’642 patent. The Commission, having reviewed the ID, the parties’ submissions, and the evidence of record, has determined to take no position as to whether UEI satisfied the economic prong with respect to

any of the three patents under Section 337(a)(3)(B).⁹ The Commission determined not to review and thus adopted the ID's findings that UEI satisfied the economic prong of the domestic industry requirement with respect to all three patents under Section 337(a)(3)(C). *See* ID at 134-38; 86 Fed. Reg. at 51382.

V. REMEDY, THE PUBLIC INTEREST, AND BONDING

The Commission has “broad discretion in selecting the form, scope, and extent of the remedy.” *Viscofan, S.A. v. US. Int’l Trade Comm’n*, 787 F.2d 544, 548 (Fed. Cir. 1986).

A. Limited Exclusion Order

Section 337(d)(1) provides that “[i]f the Commission determines, as a result of an investigation under this section, that there is a violation of this section, it shall direct that the articles concerned, imported by any person violating the provision of this section, be excluded from entry into the United States, unless, after considering the [public interest], it finds that such articles should not be excluded from entry.” 19 U.S.C. § 1337(d)(1).

The Commission, having found a violation of Section 337 with respect to the ’196 patent, has determined to issue a limited exclusion order (“LEO”) precluding the importation of televisions, set top boxes, remote control devices, streaming devices, and sound bars that incorporate Roku components that infringe one or more of asserted claims 1, 3, 11, and 13-15 of the ’196 patent, pursuant to Section 337(d)(1). The Commission has determined to include “televisions” in its LEO because the ’196 patent, as explained earlier, may cover embodiments in

⁹ Vice Chair Stayin joins the Commission’s determination to take no position on this issue. If the Commission were to reach the issue, he would affirm the ID’s findings that UEI satisfied the economic prong with respect to all three patents under Section 337(a)(3)(B). In his view, UEI is not required to show its QuickSet investments are significant in comparison to the Samsung DI Products, and UEI demonstrated that its investments are significant as set forth in the ID. *See* ID at 133-34.

which the “second media device” (here, the Roku Soundbar or Ultra) is either a stand-alone device or incorporated into a television. The LEO also includes the standard certification provision allowing U.S. Customs and Border Protection (“CBP”), at its discretion, to require an importer seeking to import to certify that, to the best of its knowledge and after having obtained a determination from the Commission, that the articles it seeks to import are not excluded from entry under the LEO.

The Commission, as is customary, is not limiting the LEO to covered products that were actually adjudicated to infringe the ’196 patent so that it may ensure that the exclusion order affords complainant “complete relief” and cannot be “easily circumvented.” *See Certain Graphics Systems, Components Thereof, and Consumer Products Containing Same*, Inv. No. 337-TA-1044, Comm’n Op. at 66 (Sept. 18, 2018) (LEO covers any of respondents’ products that infringe the patent at issue and is not limited to particular models); *Certain Human Milk Oligosaccharides and Methods of Producing Same*, Comm’n Op. at 19-20, 2020 WL 3073788 at *11 (June 20, 2020) (redesigned products may still fall within the scope of the remedial orders even if they were not adjudicated for infringement in the original investigation), *aff’d*, *Jennewein Biotechnologie GmbH v. Int’l Trade Comm’n*, 2021 WL 4250784 (Fed. Cir. Sept. 17, 2021) (unpublished); *Certain Hardware Logic Emulation Systems and Components Thereof*, Inv. No. 337-TA-383, Comm’n Op., 1998 WL 307240 at *9 (Mar. 9, 1998) (Commission’s remedial orders typically extend to products covered by the patent claims at issue and are not limited only to specific models selected for the infringement analysis in order to avoid easy circumvention).

On agreement of the parties, the Commission includes an exemption for those revised Roku products that were adjudicated in this investigation and found to be non-infringing, specifically, the Roku Ultra (Bryan 2) and Roku Soundbar (Fruitland). This exemption does not

apply to any products that were not adjudicated in this investigation or not found to be non-infringing. The Commission also declines to extend this exemption to Roku products that allegedly “contain the same functionality” as these non-infringing products, because such a clause would be too broad and vague and thus complicate, rather than facilitate, enforcement.

The Commission also declines Roku’s request to include an exemption for warranty, service, and repair, as Roku failed to provide sufficient evidence to support such a provision. The Commission declines to include an exemption for spare parts or other components because Roku did not provide any evidence to support such an exemption, identify any spare parts to be exempted, or explain the importance of such spare parts. *See Certain Non-Volatile Memory Devices and Products Containing Same*, Inv. No. 337-TA-1046, Comm’n Op. at 50, 2018 WL 6012622 at *31 (Oct. 26, 2018) (finding exemption for service or repair was not warranted when the respondent did not identify any specific replacement parts or explain what repairs were needed).

B. Cease and Desist Order

Section 337(f)(1) provides that in addition to, or in lieu of, the issuance of an exclusion order, the Commission may issue a cease and desist order (“CDO”) as a remedy for violation of Section 337. *See* 19 U.S.C. § 1337(f)(1). CDOs are generally issued when, with respect to the imported infringing products, respondents maintain commercially significant inventories in the United States or have significant domestic operations that could undercut the remedy provided by an exclusion order.¹⁰ *See, e.g., Certain Table Saws Incorporating Active Injury Mitigation*

¹⁰ When the presence of infringing domestic inventory or domestic operations is asserted as the basis for a CDO under Section 337(f)(1), Commissioner Schmidtlein does not adopt the view that the inventory or domestic operations needs to be “commercially significant” in order to issue the CDO. *See, e.g., Certain Magnetic Tape Cartridges and Components Thereof*, Inv. No. 337-TA-1058, Comm’n Op. at 65, n.24 (Mar. 25, 2019); *Table Saws*, Comm’n Op. at 6-7, n.2 (Feb. 1, 2017). In Commissioner Schmidtlein’s view, the presence of some infringing domestic

Technology & Components Thereof (“*Table Saws*”), Inv. No. 337-TA-965, Comm’n Op. at 4-6 (Feb. 1, 2017); *Certain Protective Cases & Components Thereof*, Inv. No. 337-TA-780, USITC Pub. No. 4405, Comm’n Op. at 28 (Nov. 19, 2012). Complainants bear the burden on this issue. “A complainant seeking a cease and desist order must demonstrate, based on the record, that this remedy is necessary to address the violation found in the investigation so as to not undercut the relief provided by the exclusion order.” *Table Saws*, Comm’n Op. at 5 (collecting cases); *see also* H.R. REP. No. 100-40, at 160 (1987).

The Commission has determined to issue a CDO directed to respondent Roku, with the standard language and the exemption noted above for products adjudicated in this investigation and found to be non-infringing. The Commission finds that a cease and desist order is warranted in view of Roku’s [REDACTED] of domestic inventory of products that infringe the ’196 patent. RD at 142-43. Although Roku disputes whether this inventory is “commercially significant,” it does not dispute its total value, which is substantial.

C. Public Interest

Section 337 requires the Commission, upon finding a violation of Section 337, to issue an LEO “unless, after considering the effect of such exclusion upon the public health and welfare, competitive conditions in the United States economy, the production of like or directly competitive articles in the United States, and United States consumers, it finds that such articles

inventory or domestic operations, regardless of its commercial significance, provides a basis to issue a CDO. *Id.*

should not be excluded from entry.” 19 U.S.C. § 1337(d)(1). The Commission must also consider these public interest factors before issuing a CDO. 19 U.S.C. § 1337(f)(1).

Under appropriate facts and circumstances, the Commission may determine that no remedy should issue because of the adverse impacts on the public interest. *See, e.g., Certain Fluidized Supporting Apparatus & Components Thereof*, Inv. Nos. 337-TA-182/188, USITC Pub. 1667, Comm’n Op. at 1–2, 23–25 (Oct. 1984) (finding that the public interest warranted denying complainant’s requested relief). Moreover, when the circumstances of a particular investigation so require, the Commission has tailored its relief in light of the statutory public interest factors.

The statute requires the Commission to consider and make findings on the public interest in every case in which a violation is found regardless of the quality or quantity of public interest information supplied by the parties. 19 U.S.C. § 1337(d)(1), (f)(1). The Commission publishes a notice inviting the parties as well as interested members of the public and interested government agencies to gather and present evidence on the public interest at multiple junctures in the proceeding.¹¹ 19 U.S.C. § 1337(d)(1) & (f)(1). The Commission received no response to its request for comments on the public interest from any interested third parties. *See* 86 Fed. Reg. 38126 (July 19, 2021).

Roku admits that the statutory public interest factors do not preclude issuance of a remedial order if the Commission finds a violation. Roku’s Resp. at 34. The Commission also finds the public interest does not warrant the repair and replacement provisions, broader exemptions, or other provisions Roku sought to include in the remedial orders. *See id.* at 33.

¹¹ The Commission did not ask the ALJ to make findings regarding the public interest when it instituted the investigation. *See* 85 Fed. Reg. at 31211-12.

1. Public Health and Welfare

The covered products are certain media streaming products, remote controls, and related components imported, sold for importation, or sold in the United States after importation by Roku that infringe one or more claims of the '196 patent. The Commission finds, and Roku does not contend otherwise, that these consumer products do not implicate any public health, national security or welfare, or other public interest concerns. Thus, an exclusion order will not adversely impact public health or welfare under Section 337(d)(1), (f)(1).

2. Competitive Conditions in the United States

The Commission finds, and Roku does not dispute, that there are multiple manufacturers and importers of similar and media streaming devices. *See* UEI's Resp. at 27. The exclusion of Roku's covered products will not adversely affect competitive conditions in the United States or the ability of other companies to innovate or compete in this space. To the contrary, effective enforcement of legitimate patent rights encourages competition among providers and innovation in new technologies and competing products. Moreover, the exemption for Roku products that were adjudicated and found to be non-infringing will offset Roku's concerns regarding potentially denying consumers access to lawful, non-infringing products. *See* Roku's Resp. at 33. Thus, the Commission finds that issuing an exclusion order will not adversely impact competitive conditions in the U.S. economy under Section 337(d)(1), (f)(1).

3. The Production of Like or Directly Competitive Articles in the United States

The Commission finds, and Roku does not dispute, that the exclusion of Roku's covered products will not adversely affect the production of like or directly competitive articles in the United States. Neither party, in fact, presents any evidence that any competitive articles are produced in the United States, apart from UEI's investments in R&D and engineering labor

relating to QuickSet. Moreover, the exclusion of an unlawfully infringing product may encourage the development, marketing, and sale of products in lawful domestic competition. The Commission finds that an exclusion order will not adversely impact the production of like or directly competitive articles in the United States under Section 337(d)(1), (f)(1).

4. United States Consumers

The Commission finds, and Roku does not deny, that there are multiple providers of media streaming devices or other competitive products, including UEI and its licensees Samsung and Sony, and other third parties. UEI's Resp. at 27. Exclusion of the covered products will not adversely impact U.S. consumers, who will be able to purchase other competitive products from these and other providers. *See id.* The Commission also finds that the public and U.S. competitive interests generally benefit from enforcement of intellectual property rights. *Certain Two-Handle Centerset Faucets & Escutcheons & Components Thereof*, Inv. No. 337-TA-422, Comm'n Op. at 9 (July 21, 2000). Thus, the Commission finds that an exclusion order will not adversely impact U.S. consumers under Section 337(d)(1), (f)(1).

E. Bond

If the Commission enters an exclusion order or a cease and desist order, a respondent may continue to import and sell its products during the 60-day period of Presidential review under a bond in an amount determined by the Commission to be "sufficient to protect the complainant from any injury." 19 U.S.C. § 1337(j)(3); see also 19 C.F.R. § 210.50(a)(3).

When reliable price information is available in the record, the Commission has often set the bond in an amount that would eliminate the price differential between the domestic product and the imported, infringing product. *See Certain Microsphere Adhesives, Processes for Making Same, & Prods. Containing Same, Including Self-stick Repositionable Notes*, Inv. No. 337-TA-

366, USITC Pub. No. 2949, Comm’n Op. at 24 (Jan. 16, 1996). The Commission has also used a reasonable royalty rate to set the bond amount where a reasonable royalty rate could be ascertained from the evidence in the record. *See, e.g., Certain Audio Digital-to-Analog Converters & Prods. Containing Same*, Inv. No. 337-TA-499, Comm’n Op. at 25 (Mar. 3, 2005). Where the record establishes that the calculation of a price differential is impractical or there is insufficient evidence in the record to determine a reasonable royalty, the Commission has imposed a 100 percent bond. *See, e.g., Certain Liquid Crystal Display Modules, Prods. Containing Same, & Methods Using the Same*, Inv. No. 337-TA-634, Comm’n Op. at 6-7 (Nov. 24, 2009). The complainant bears the burden of establishing the need for a bond. *Certain Rubber Antidegradants, Components Thereof & Prods. Containing Same*, Inv. No. 337-TA-533, USITC Pub. No. 3975, Comm’n Op. at 40 (July 21, 2006).

The Commission has determined to impose a bond in the amount of zero (0) percent of entered value during the period of Presidential review. UEI does not set out any price comparisons in its briefs on review, but it did argue in its post-hearing brief that “the Accused Products can vary dramatically in price (\$12 for Roku remote to \$100 for a Roku Ultra to \$149 for a Roku Soundbar to thousands of dollars for Roku TVs) as do the DI Products (versus thousands of dollars for some Samsung televisions).” Complainant’s Initial Post-Hearing Brief at 144. UEI, however, does not explain which of the accused Roku products, how many, or to what extent they actually compete against downstream products (televisions) made by UEI’s licensees, including Samsung.

Thus, UEI has not carried its burden of establishing the need for a bond or the amount of any bond. *See Rubber Antidegradants*, Comm’n Op. at 40; *Certain Digital Video Receivers and*

Related Hardware and Software Components, Inv. No. 337-TA-1103, Comm'n Op. at 32 (May 13, 2020) (denying bond due to lack of evidence on price differentials or reasonably royalties).

VI. CONCLUSION

For the reasons set forth herein and in the ID, the Commission determines that UEI has established a violation of Section 337 by Roku with respect to claims 1, 3, 11, and 13-15 of the '196 patent. The investigation is hereby terminated with a finding of a violation of Section 337. The Commission determines that the appropriate remedy is a limited exclusion order and cease and desist order. The Commission further finds that the public interest does not preclude issuance of a remedy, and it sets a bond of zero (0) percent applicable to imports during the Presidential review period.

By order of the Commission.



Secretary to the Commission

Issued: November 10, 2021

**CERTAIN ELECTRONIC DEVICES, INCLUDING
STREAMING PLAYERS, TELEVISIONS, SET TOP
BOXES, REMOTE CONTROLLERS, AND
COMPONENTS THEREOF**

Inv. No. 337-TA-1200

CONFIDENTIAL CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **COMMISSION OPINION** has been served upon the following parties as indicated, on **November 10, 2021**.



U.S. International Trade Commission
500 E Street, SW, Room 112
Washington, DC 20436

On Behalf of Complainant Universal Electronics, Inc.:

Adam D. Swain, Esq.
ALSTON & BIRD LLP
950 F Street NW
Washington, DC 20004
Email: Adam.Swain@alston.com

- ☐ Via Hand Delivery
- ☐ Via Express Delivery
- ☐ Via First Class Mail
- ☒ Other: Email Notification
of Availability for Download

On Behalf of Respondent Roku Inc.:

Matthew J. Rizzolo, Esq.
ROPES & GRAY LLP
2099 Pennsylvania Avenue, NW
Washington, DC 20006
Email: matthew.rizzolo@ropesgray.com

- ☐ Via Hand Delivery
- ☐ Via Express Delivery
- ☐ Via First Class Mail
- ☒ Other: Email Notification
of Availability for Download

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NONCONFIDENTIAL VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

In the Matter of

**CERTAIN ELECTRONIC DEVICES,
INCLUDING STREAMING PLAYERS,
TELEVISIONS, SET TOP BOXES,
REMOTE CONTROLLERS, AND
COMPONENTS THEREOF**

Inv. No. 337-TA-1200

**INITIAL DETERMINATION ON VIOLATION OF SECTION 337 AND
RECOMMENDED DETERMINATION ON REMEDY AND BOND**

Administrative Law Judge Cameron Elliot

(July 9, 2021)

Pursuant to the Notice of Investigation and Rule 210.42(a) of the Rules of Practice and Procedure of the United States International Trade Commission, this is my Initial Determination in the matter of *Certain Electronic Devices, Including Streaming Players, Televisions, Set Top Boxes, Remote Controllers, And Components Thereof*, Investigation No. 337-TA-1200.

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~~CONFIDENTIAL MATERIAL OMITTED~~**TABLE OF ABBREVIATIONS**

CDX	Complainant's Demonstrative Exhibit
CIB	Complainant's Initial Post-Hearing Brief
CPB	Complainant's Pre-Hearing Brief
CSB	Complainant's Supplemental Pre-Hearing Brief
CPX	Complainant's Physical Exhibit
CRB	Complainant's Reply Post-Hearing Brief
CX	Complainant's Exhibit
Dep. Tr.	Deposition Transcript
Tr.	Hearing Transcript
JX	Joint Exhibit
RDX	Respondents' Demonstrative Exhibit
RIB	Respondents' Initial Post-Hearing Brief
RPB	Respondents' Pre-Hearing Brief
RSB	Respondents' Supplemental Pre-Hearing Brief
RPX	Respondents' Physical Exhibit
RRB	Respondents' Reply Post-Hearing Brief
RX	Respondents' Exhibit

I. INTRODUCTION

A. Procedural Background

Complainant Universal Electronics Inc. (“UEI” or “Complainant”) filed the complaint underlying this investigation on April 16, 2020. The complaint identified Roku Inc. (“Roku”); TCL Electronics Holdings Limited, f/k/a TCL Multimedia Holdings Limited, Shenzhen TCL New Technology Company Limited, TCL King Electrical Appliances (Huizhou) Company Limited, TTE Technology Inc. d/b/a/ TCL USA and TCL North America, TCL Corp., TCL Moka, Int’l Ltd., TCL Overseas Marketing Ltd., TCL Industries Holdings Co., Ltd., TCL Smart Device (Vietnam) Company, Ltd. (collectively, “TCL”); Hisense Co. Ltd., Hisense Electronics Manufacturing Company of America Corporation d/b/a Hisense USA, Hisense Import & Export Co. Ltd., Qingdao Hisense Electric Co., Ltd., Hisense International (HK) Co., Ltd. (collectively, “Hisense”); Funai Electric Co., Ltd., Funai Corporation Inc., and Funai (Thailand) Co., Ltd. (together, “the Respondents”) as Respondents. The complaint alleged that Respondents import or sell in connection with an importation certain touch-controlled mobile devices, including smartphone and tablet devices, computers, including notebook and laptop computers, and associated components, that infringe one or more of claims 1, 2, 4, 6-9, and 11-16 of U.S. Patent No. 9,911,325 (“the 325 patent”); claims 1, 2-7, 12, 14, 19, 20, and 22-25 of U.S. Patent No. 7,589,642 (“the 642 patent”) (together “the Mui patents”); claims 1-6 and 20 of U.S. Patent No. 7,969,514 (“the 514 patent”); claims 1-11 of U.S. Patent No. 10,600,317 (“the 317 patent”) (together “the Haughawout patents”); claims 1-22 of U.S. Patent No. 10,593,196 (“the 196 patent”); and claims 1-3 and 5-8 of U.S. Patent No. 9,716,853 (“the 853 patent”). By publication of a notice in the *Federal Register* on May 22, 2020, the U.S. International Trade Commission commenced an investigation into:

[W]hether there is a violation of subsection (a)(1)(B) of section 337 in the

importation into the United States, the sale for importation, or the sale within the United States after importation of certain products identified in paragraph (2) by reason of infringement of one or more of claims 1, 2, 4, 6-9, and 11-16 of the '325 patent; claims 1, 2-7, 12, 14, 19, 20, and 22-25 of the '642 patent; claims 1-6 and 20 of the '514 patent; claims 1-11 of the '317 patent; claims 1-22 of the '196 patent; claims 1-3 and 5-8 of the '853 patent; and whether an industry in the United States exists as required by subsection (a)(2) of section 337;

85 Fed. Reg. 31211 (May 22, 2020). On June 17, 2020, I set a target date of September 22, 2020 for completion of this investigation. Order No. 7. Also on June 17, 2020, I set a *Markman* hearing date of August 19-20, 2020 and an evidentiary hearing date of March 1–5, 2021. *Id.* On December 30, 2020 Roku moved for summary determination that UEI lacked standing to assert the 196 Patent. I granted this motion in a non-final initial determination, Order No. 40 (February 1, 2021). The Commission reversed the decision on February 24, 2021. EDIS Doc. No. 735072. In light of the Commission's decision, I issued an initial determination revising the target date to November 10, 2021 and moving the hearing date to April 19, 2021. Order No. 59 (February 26, 2021). The Commission did not review this initial determination. EDIS Doc. No. 737267.

On August 19, 2020, I held a technology tutorial and *Markman* hearing, and on October 1, 2020 I issued Order No. 24, construing certain claim terms of the patents at issue. On July 22, 2020 Respondents moved for summary determination that the asserted claims of the 514 and 317 patents are invalid for claiming patent ineligible subject matter under 35 U.S.C. § 101, which was denied on September 14, 2020 with Order No. 21. On December 29, UEI moved for summary determination that claim 19 of the 642 patent is practiced by the domestic industry products and infringed by Roku's accused products. By a non-final initial determination, I granted summary determination that claim 19 of the 642 patent is practiced by the domestic industry products and is infringed by the Elk series of accused products. The Commission determined not to review Order No. 38 on February 19, 2021. EDIS Doc. No 734530. On December 30, 2020 UEI moved for summary determination that the technical prong of the domestic industry requirement is satisfied

as to certain claims of the 642 and 325 patents. I issued an initial determination granting the motion for summary determination that the technical prong for the 325 Patent is satisfied by the Sony domestic industry products and the Microsoft domestic industry products and denying summary determination as to the 642 patent. Order No. 41 (January 25, 2021). The Commission did not review this non-final ID. EDIS Doc. No. 735069 (February 24, 2021).

With various motions, UEI moved to terminate the investigation as to various claims, patents, and respondents. All of the motions were granted by non-final initial determinations, and the Commission did not review these non-final ID's. *See* Orders 27, 32, 34, 44, 49, 66, and 67 and Commission decisions not to review, EDIS Doc. Nos. 728820, 729547, 731388, 734624, 735095, 739284, and 740651, respectively. Thus, the only remaining respondent is Roku and the remaining asserted patent claims are: claim 19 of the 642 patent; claims 3, 6, 9, and 11 of the 317 patent; and claims 1, 3, 11, 13-15 of the 196 patent for issues of infringement and claims 1 and 2 of the 196 patent for issues of domestic industry.

The evidentiary hearing took place as scheduled on April 19-23, 2021.

Pursuant to the procedural schedule, and Order No. 64, the parties submitted initial and reply post-hearing briefs on May 10, 2021 and May 19, 2021, respectively. As of the date of this initial determination, no motions remain pending.

B. The Parties

Complainant Universal Electronics Inc. is a United States corporation organized and existing under the laws of Delaware and has its principal place of business in Scottsdale, Arizona. CIB at 1. UEI researches, designs, and produces products in the area of entertainment interaction and control. UEI's products include remote-controlled home entertainment devices and home automation control modules, as well as wired Consumer Electronics Control ("CEC") and wireless

Internet Protocol (“IP”) control protocols commonly found on many of the latest HDMI and internet connected devices. Complaint, ¶¶ 9-10. UEI’s QuickSet, in which the asserted patents are incorporated, is a product family dedicated to simplifying and automating the configuration and control of remote controls and home entertainment devices. Complaint, ¶ 11.

Respondent Roku, Inc. is a corporation organized and existing under the laws of Delaware, with a principal place of business in Los Gatos, California. Complaint, ¶ 16. Roku creates TV streaming platforms and also partners with third party TV manufacturers for the development of Roku-branded TVs. RIB at 9. .

C. The Asserted Patents and Claims

The Asserted Patents all relate to remote controls and functionality for controlling televisions and other electronic devices. Remote controls operate a second device, such as a TV, by communicating via wireless protocols and signals. Historically, remote controls were device specific and capable of controlling only one particular device. The present patents relate to “universal remotes” that are programmed to operate a variety of types and/or brands of devices, and specifically, are related to processes for automating and streamlining the process for setting up a universal remote control to control a target device.

The following patent claims are at issue in this investigation:

U.S. Patent No.	Roku	Domestic Industry
7,589,642	19	19
10,600,317	3, 6, 9, 11	3, 6, 9, 11
10,593,196	1, 3, 11, 13-15	1, 2

See CIB at 12, 29, 93.

The 642 patent was filed on December 16, 2003 and issued on September 15, 2009, and is entitled “Relaying Key Code Signals Through A Remote Control Device.” The 642 patent is assigned on its face to UEI Cayman Inc. UEI owns by assignment all rights, title, and interest in the 642 patent. Complaint at ¶ 62. The 642 patent generally relates to remote control devices and, more specifically, “to relaying key code signals through a remote control device to operate an electronic consumer device.” JX-0002 (642 patent) at 1:7-8. The 642 patent teaches a remote control device to control a selected one of multiple different electronic consumer devices without requiring the code set associated with the selected electronic consumer device to be stored on the remote control device. JX-0002 (642 patent) at 1:59-62.

The 317 patent issued on March 24, 2020 from a continuation application that was filed on April 24, 2019. The 317 patent is entitled “System And Method For Simplified Setup Of A Universal Remote Control,” and is assigned on its face to UEI. The 317 patent generally relates to a “system and method for enabling set up of a controlling device capable of controlling a plurality of appliances, via an interactive instruction set and associated programming.” 317 patent, Abstract. The 317 patent describes a universal remote control that is “easily setup and configured to command appliances of various types and various manufacturers.” 317 patent at 2:26-27.

The 196 patent is entitled, “System And Method For Optimized Appliance Control,” and was filed on November 21, 2018. Through a series of continuations and a continuation-in-part, the 196 patent claims the benefit of a provisional application filed on October 28, 2011. CSB at 6. The 196 patent relates generally to enhanced methods for appliance control via use of a controlling device, such as a remote control, smart phone, tablet computer, etc., and in particular to methods for taking advantage of improved appliance control communication methods and/or

command formats in a reliable manner that is largely transparent to a user and/or seamlessly integrated with legacy appliance control technology. 196 patent at 1:66-3:6.

D. Products at Issue

1. Domestic Industry Products

The domestic industry products (“DI Products”) in this investigation are UEI’s IR and RF remote controllers, model numbers R35602B00-00001, R35602BA00-00004, R32140BA00-00001, R32140BA00-00002, R32040AA00-00007, and R32027BA00-00012. CIB at 14. UEI further claims that its QuickSet technology, which is deployed in third party set-top boxes, television, and game consoles, is part of its domestic industry. *Id.*

The third party products that purportedly use UEI’s QuickSet and are a part of its domestic industry in this investigation are made by Sony, with the Sony TV 43X800G being a representative of the Sony DI Products; Microsoft, with the Xbox One S being a representative of the Microsoft DI Products; and Samsung, with the Samsung RU8000 TV being a representative of the Samsung DI Products. *Id.* at 14-15.

2. Accused Products

The accused products in this investigation include the Roku Streaming Boxes (“Roku STBs”), Roku Streaming Sticks (“Roku sticks”), and Roku soundbars (“Roku soundbar”) (CX-1139C at ¶4). The Parties stipulated that Roku Ultra, Platform: Bryan 2 (Launch Date Oct. 2019) with Roku OS version 9.3.0 or 9.4.0 is representative of the Roku Streaming Boxes (CX-1139C at ¶20). *See* CX-1139C at ¶2 and CX-1327C at 21-22. The Parties stipulated that the Roku Streaming Stick +, Platform: Amarillo (Launch Date Oct. 2019) with Roku OS version 9.3.0 or 9.4.0 is representative of the Roku Streaming Sticks (CX-1139C at ¶20). *See* CX-1139C at ¶1 and CX-1327C at 21-22. The Parties stipulated that the Roku Smart Soundbar, Platform: Fruitland (Launch

Date Oct. 2019) with Roku OS version 9.3.0 or 9.4.0 is representative of the Roku Streaming Soundbars. *See* CX-1139C at ¶3 and CX-1327C at 21-22.

The accused products also include Roku RF/IR remotes, which Roku calls Alice Remotes (Alice-2, Alice-4, Alice-5, Alice-6, Alice-7, Alice-8, and Alice-9) and Elk Remotes (*i.e.*, Elk-1, Elk-2, and Elk-3). The Parties stipulated that Alice-7 is representative of the Alice Remotes. CX-1139C at ¶27.

The following table summarizes the patents, products, and claims currently asserted against Roku:

<u>Asserted Patent</u>	<u>Accused Product</u>	<u>Asserted Claims</u>
642 Patent	Roku Elk Remotes, Roku Alice Remotes	1-7,12, 19, and 22-24
317 Patent	Roku Ultra, Roku Streaming Stick+, Roku Soundbar	3, 6, 9, and 11
196 Patent	Roku Ultra, Revised Roku Ultra, Roku Soundbar, Revised Roku Soundbar	1, 3, 11, 13-15

Roku alleges that after this investigation was instituted, it designed, implemented and imported “Revised Roku Products” that do not infringe the 196 Patent. RIB at 42. UEI submits that these Revised Roku Products are not properly part of this investigation. CIB at 50. These products are discussed below.

II. STANDARDS OF LAW

A. Standing

Commission Rule 210.12 requires the complainant(s) filing an intellectual property-based complaint to show that “at least one complainant is the owner or exclusive licensee of the subject intellectual property.” 19 C.F.R. § 210.12(a)(7); *see also IpVenture, Inc. v. ProStar Computer,*

Inc., 503 F.3d 1324, 1325 (Fed. Cir. 2007) (the only entity(ies) that can enforce the rights protected by a patent is the entity(ies) that owns or controls all substantial rights in that patent). Standing is ordinarily a question of law, which may rest on underlying findings of jurisdictional fact. *Abraxis Bioscience, Inc. v. Navinta LLC*, 625 F.3d 1359, 1363-64 (Fed. Cir. 2010).

Ownership of a patent initially vests in the inventor(s) as a matter of law. *Regents of the University of New Mexico v. Knight*, 321 F.3d 1111, 1118-19 (Fed. Cir. 2003) (“UNM”). An inventor, however, can assign all or part of his/her interests in a patent, patent application, or invention to another person or entity (the assignee) by means of a written assignment. *Id.* When a patent has multiple co-owners, each possessing an undivided part of the patent, all co-owners must be joined to establish standing to bring a civil action for patent infringement. *Israel Bio-Eng’g Project v. Amgen Inc.*, 475 F.3d 1256, 1264-65 (Fed. Cir. 2007). Without joinder, a single co-owner lacks the standing needed to sue for patent infringement. *Id.*

Issues of patent ownership are thus distinct from questions of inventorship. *Id.* at 1263. Ownership depends upon the substance of what was granted through assignment. *Id.* at 1265. A court must carefully consider the intention of the parties and the language of the grant in order to construe the substance of an assignment. *Id.* The interpretation of an assignment is ordinarily a question of law, which in some cases may rest on underlying factual findings. *Abraxis*, 625 F.3d at 1363. Although contractual obligations and transfers of property are ordinarily governed by state law, a patent assignment is interpreted pursuant to federal law when it is intimately related to the issue of standing. *Abraxis*, 625 F.3d at 1364; *UNM*, 321 F.3d at 1118-19.

B. Claim Construction

“The construction of claims is simply a way of elaborating the normally terse claim language in order to understand and explain, but not to change, the scope of the claims.” *Embrex*,

Inc. v. Serv. Eng'g Corp., 216 F.3d 1343, 1347 (Fed. Cir. 2000). Although most of the disputed claim terms were construed in an earlier order, some of the issues presented below are only resolvable with additional claim construction.

Claim construction focuses on the intrinsic evidence, which consists of the claims themselves, the specification, and the prosecution history. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (en banc); *see also Markman v. Westview Instr., Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc). As the Federal Circuit in *Phillips* explained, courts must analyze each of these components to determine the “ordinary and customary meaning of a claim term” as understood by a person of ordinary skill in art at the time of the invention. 415 F.3d at 1313. “Such intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language.” *Bell Atl. Network Servs., Inc. v. Covad Commc'ns Grp., Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001).

“It is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’” *Phillips*, 415 F.3d at 1312 (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). “Quite apart from the written description and the prosecution history, the claims themselves provide substantial guidance as to the meaning of particular claims terms.” *Id.* at 1314; *see Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1331 (Fed. Cir. 2001) (“In construing claims, the analytical focus must begin and remain centered on the language of the claims themselves, for it is that language that the patentee chose to use to ‘particularly point [] out and distinctly claim [] the subject matter which the patentee regards as his invention.’”). The context in which a term is used in an asserted claim can be “highly instructive.” *Phillips*, 415 F.3d at 1314. Additionally, other claims in the same patent, asserted or unasserted, may also provide

guidance as to the meaning of a claim term. *Id.* “Courts do not rewrite claims; instead, we give effect to the terms chosen by the patentee.” *K-2 Corp. v. Salomon S.A.*, 191 F.3d 1356, 1364 (Fed. Cir. 1999). “[T]he specification ‘is always highly relevant to the claim construction analysis. Usually it is dispositive; it is the single best guide to the meaning of a disputed term.’” *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). “[T]he specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor’s lexicography governs.” *Id.* at 1316.

In addition to the claims and the specification, the prosecution history should be examined, if in evidence. *Phillips*, 415 F.3d at 1317; see *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 913 (Fed. Cir. 2004). The prosecution history can “often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be.” *Phillips*, 415 F.3d at 1317; see *Chimie v. PPG Indus. Inc.*, 402 F.3d 1371, 1384 (Fed. Cir. 2005) (“The purpose of consulting the prosecution history in construing a claim is to exclude any interpretation that was disclaimed during prosecution.”).

When the intrinsic evidence does not establish the meaning of a claim, then extrinsic evidence (*i.e.*, all evidence external to the patent and the prosecution history, including dictionaries, inventor testimony, expert testimony, and learned treatises) may be considered. *Phillips*, 415 F.3d at 1317. Extrinsic evidence is generally viewed as less reliable than the patent itself and its prosecution history in determining how to define claim terms. *Id.* “The court may receive extrinsic evidence to educate itself about the invention and the relevant technology, but the court may not use extrinsic evidence to arrive at a claim construction that is clearly at odds with

the construction mandated by the intrinsic evidence.” *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973, 977 (Fed. Cir. 1999).

The construction of a claim term is generally guided by its ordinary meaning. However, courts may deviate from the ordinary meaning when: (1) “the intrinsic evidence shows that the patentee distinguished that term from prior art on the basis of a particular embodiment, expressly disclaimed subject matter, or described a particular embodiment as important to the invention;” or (2) “the patentee acted as his own lexicographer and clearly set forth a definition of the disputed claim term in either the specification or prosecution history.” *Edwards Lifesciences LLC v. Cook Inc.*, 582 F.3d 1322, 1329 (Fed. Cir. 2009); *see GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014) (“the specification and prosecution history only compel departure from the plain meaning in two instances: lexicography and disavowal.”); *Omega Eng’g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1324 (Fed. Cir. 2003) (“[W]here the patentee has unequivocally disavowed a certain meaning to obtain his patent, the doctrine of prosecution disclaimer attaches and narrows the ordinary meaning of the claim congruent with the scope of the surrender.”); *Rheox, Inc. v. Entact, Inc.*, 276 F.3d 1319, 1325 (Fed. Cir. 2002) (“The prosecution history limits the interpretation of claim terms so as to exclude any interpretation that was disclaimed during prosecution.”). Nevertheless, there is a “heavy presumption that a claim term carries its ordinary and customary meaning.” *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) (citations omitted). The standard for deviating from the plain and ordinary meaning is “exacting” and requires “a clear and unmistakable disclaimer.” *Thorner v. Sony Computer Entm’t Am. LLC*, 669 F.3d 1362, 1366-67 (Fed. Cir. 2012); *see Epistar Corp. v. Int’l Trade Comm’n*, 566 F.3d 1321, 1334 (Fed. Cir. 2009) (requiring “expressions of manifest exclusion or restriction,

representing a clear disavowal of claim scope” to deviate from the ordinary meaning) (citation omitted).

C. Infringement

“An infringement analysis entails two steps. The first step is determining the meaning and scope of the patent claims asserted to be infringed. The second step is comparing the properly construed claims to the device accused of infringing.” *Markman*, 52 F.3d at 976.

A patentee may prove infringement either literally or under the doctrine of equivalents. Infringement of either sort must be proven by a preponderance of the evidence. *SmithKline Diagnostics, Inc. v. Helena Labs. Corp.*, 859 F.2d 878, 889 (Fed. Cir. 1988). A preponderance of the evidence standard “requires proving that infringement was more likely than not to have occurred.” *Warner-Lambert Co. v. Teva Pharm. USA, Inc.*, 418 F.3d 1326, 1341 n.15 (Fed. Cir. 2005).

Literal infringement, a form of direct infringement, is a question of fact. *Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1332 (Fed. Cir. 2008). “To establish literal infringement, every limitation set forth in a claim must be found in an accused product, exactly.” *Microsoft Corp. v. GeoTag, Inc.*, 817 F.3d 1305, 1313 (Fed. Cir. 2016) (quoting *Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1575 (Fed. Cir. 1995)). If any claim limitation is absent, there is no literal infringement of that claim as a matter of law. *Bayer AG v. Elan Pharm. Research Corp.*, 212 F.3d 1241, 1247 (Fed. Cir. 2000).

D. Domestic Industry

In an investigation based on a claim of patent infringement, Section 337 requires that an industry in the United States, relating to the articles protected by the patent, exist or be in the process of being established. 19 U.S.C. § 1337(a)(2). Under Commission precedent, the domestic

industry requirement has been divided into (i) a “technical prong” (which requires articles covered by the asserted patent) and (ii) an “economic prong” (which requires certain levels of activity with respect to the protected articles or patent itself). *See Certain Video Game Systems and Controllers*, Inv. No. 337-TA-743, Comm’n Op. at 6-7 (April 14, 2011) (“*Video Game Systems*”).

1. Technical Prong

The technical prong of the domestic industry requirement is satisfied when the complainant in a patent-based section 337 investigation establishes that it is practicing or exploiting the patents at issue. *See* 19 U.S.C. §§ 1337 (a)(2), (3); *Certain Microsphere Adhesives, Process for Making Same and Prods. Containing Same, Including Self-Stick Repositionable Notes*, Inv. No. 337-TA-366, Comm’n Op. at 8 (U.S.I.T.C. Jan. 16, 1996). “In order to satisfy the technical prong of the domestic industry requirement, it is sufficient to show that the domestic industry practices any claim of that patent, not necessarily an asserted claim of that patent.” *Certain Ammonium Octamolybdate Isomers*, Inv. No. 337-TA-477, Comm’n Op. at 55 (U.S.I.T.C. Aug. 28, 2003). Historically, the Commission permits the complainant’s products, and those of its licensees, to be considered for technical prong purposes. *See Certain Magnetic Tape Cartridges and Components Thereof*, Inv. No. 337-TA-1058, Comm’n Op. at 28-29 (April 9, 2019).

The test for claim coverage for the purposes of the technical prong of the domestic industry requirement is the same as that for infringement. *See Certain Doxorubicin and Preparations Containing Same*, Inv. No. 337-TA-300, Initial Determination at 109 (U.S.I.T.C. May 21, 1990), *aff’d*, Views of the Commission at 22 (U.S.I.T.C. Oct. 31, 1990); *Alloc, Inc. v. Int’l Trade Comm’n*, 342 F.3d 1361, 1375 (Fed. Cir. 2003). “First, the claims of the patent are construed. Second, the complainant’s article or process is examined to determine whether it falls within the scope of the claims.” *Certain Doxorubicin and Preparations Containing Same*, Inv. No. 337-TA-300, Initial Determination at 109. As with infringement, the technical prong of the domestic industry can be

satisfied either literally or under the doctrine of equivalents. *Certain Dynamic Sequential Gradient Devices and Component Parts Thereof*, Inv. No. 337-TA-335, ID at 44, Pub. No. 2575 (U.S.I.T.C. May 15, 1992). In short, the patentee must establish by a preponderance of the evidence that the domestic product practices one or more claims of the patent.

2. Economic Prong

The “economic prong” of the domestic industry requirement is satisfied when there exists in the United States, in connection with products practicing at least one claim of the patent at issue: (A) significant investment in plant and equipment; (B) significant employment of labor or capital; or (C) substantial investment in its exploitation, including engineering, research and development, and licensing. 19 U.S.C. § 1337(a)(3). Establishment of the “economic prong” is not dependent on any “minimum monetary expenditure” and there is no need for complainant “to define the industry itself in absolute mathematical terms.” *Certain Stringed Musical Instruments and Components Thereof*, Inv. No. 337-TA-586, Comm’n Op. at 25-26 (May 16, 2008) (“*Stringed Instruments*”). However, a complainant must substantiate the significance of its activities with respect to the articles protected by the patent. *Certain Printing and Imaging Devices and Components Thereof*, Inv. No. 337-TA-690, Comm’n Op. at 30 (Feb. 17, 2011) (“*Imaging Devices*”). Further, a complainant can show that its activities are significant by showing how those activities are important to the articles protected by the patent in the context of the company’s operations, the marketplace, or the industry in question. *Id.* at 27-28. That significance, however, must be shown in a quantitative context. *Lelo Inc. v. Int’l Trade Comm’n*, 786 F.3d 879, 886 (Fed. Cir. 2015). The Federal Circuit noted that when the ITC first addressed this requirement, it found the word “‘significant’ denoted ‘an assessment of the *relative* importance of the domestic activities.’” *Id.* at 883-4 (internal citation omitted) (emphasis added). In general, “[t]he purpose of the domestic industry requirement is to prevent the ITC from becoming a forum for resolving

disputes brought by foreign complainants whose only connection with the United States is ownership of a U.S. patent.” *Certain Battery-Powered Ride-On Toy Vehicles*, Inv. No. 337-TA-314, USITC Pub. No. 2420, Initial Determination at 21 (Aug. 1991).

E. Invalidity

1. 35 U.S.C. § 102

Pursuant to 35 U.S.C. § 102, a patent claim is invalid as anticipated if:

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant;

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States;

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent;”

(g)(2) before such person’s invention thereof, the invention was made in this country by another inventor who had not abandoned, suppressed, or concealed it.

35 U.S.C. § 102 (pre-AIA). “A patent is invalid for anticipation if a single prior art reference discloses each and every limitation of the claimed invention. Moreover, a prior art reference may anticipate without disclosing a feature of the claimed invention if that missing characteristic is necessarily present, or inherent, in the single anticipating reference.” *Schering Corp. v. Geneva Pharm., Inc.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003) (citations omitted); *see Santarus, Inc. v. Par Pharm., Inc.*, 694 F.3d 1344, 1354 (Fed. Cir. 2012). “A century-old axiom of patent law holds that a product ‘which would literally infringe if later in time anticipates if earlier.’” *Upsher-Smith Labs., Inc. v. PamLab, L.L.C.*, 412 F.3d 1319, 1322 (Fed. Cir. 2005) (quoting *Schering Corp.*, 339 F.3d at 1322). Anticipation, and all other grounds of patent invalidity, must be proved by clear and convincing evidence. *Microsoft Corp. v. I4I Ltd. P’ship*, 564 U.S. 91, 95, (2011).

2. 35 U.S.C. § 103

Section 103 of the Patent Act states:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

35 U.S.C. § 103(a) (pre-AIA). “Obviousness is a question of law based on underlying questions of fact.” *Scanner Techs. Corp. v. ICOS Vision Sys. Corp. N.V.*, 528 F.3d 1365, 1379 (Fed. Cir. 2008). The underlying factual determinations include: “(1) the scope and content of the prior art, (2) the level of ordinary skill in the art, (3) the differences between the claimed invention and the prior art, and (4) objective indicia of non-obviousness.” *Id.*, citing *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18 (1966)). These factual determinations are often referred to as the “Graham factors.”

The critical inquiry in determining the differences between the claimed invention and the prior art is whether there is a reason to combine the prior art references. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418-21 (2007). In *KSR*, the Supreme Court rejected the Federal Circuit’s rigid application of the teaching-suggestion-motivation test. While the Court stated that “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does,” it described a more flexible analysis:

Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue As our precedents make clear, however, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court

can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

Id. at 418.

Since *KSR*, the Federal Circuit has announced that, where a patent challenger contends that a patent is invalid for obviousness based on a combination of prior art references, “the burden falls on the patent challenger to show by clear and convincing evidence that a person of ordinary skill in the art would have had reason to attempt to make the composition or device . . . and would have had a reasonable expectation of success in doing so.” *PharmaStem Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1360 (Fed. Cir. 2007); *see KSR*, 550 U.S. at 399 (“The proper question was whether a pedal designer of ordinary skill in the art, facing the wide range of needs created by developments in the field, would have seen an obvious benefit to upgrading Asano with a sensor.”). In addition to demonstrating that a reason exists to combine prior art references, the challenger must demonstrate that the combination of prior art references discloses all of the limitations of the claims. *Hearing Components, Inc. v. Shure Inc.*, 600 F.3d 1357, 1373-4 (Fed. Cir. 2010) (abrogated on other grounds by *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S.Ct. 2120 (2014)) (upholding finding of non-obviousness based on the fact that there was substantial evidence that the asserted combination of references failed to disclose a claim limitation); *Velandier v. Garner*, 348 F.3d 1359, 1363 (Fed. Cir. 2003) (explaining that a requirement for a finding of obviousness is that “all the elements of an invention are found in a combination of prior art references”).

An obviousness determination should also include a consideration of “secondary considerations,” that is, “commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.” *Graham*, 338 U.S. at 17-18. “For [such] objective evidence to be accorded substantial weight, its proponent must establish a nexus between the evidence and the merits of

the claimed invention.” *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995); *see Merck & Cie v. Gnosis S.P.A.*, 808 F.3d 829, 837 (Fed. Cir. 2015). “Where the offered secondary consideration actually results from something other than what is both claimed and novel in the claim, there is no nexus to the merits of the claimed invention.” *In re Huai-Hung Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011); *see Apple Inc. v. Samsung Elecs. Co., Ltd.*, 839 F.3d 1034, 1054-1056 (Fed. Cir. 2016).

III. IMPORTATION AND JURISDICTION

Roku does not dispute it imports the Accused Roku Players or the Accused Roku Remotes (CX-0379C Roku (Bright Dep. Tr. 21:3-25; 24:4-22; CPX-0078C) Thus, the Commission has in rem jurisdiction. Subject-matter jurisdiction exists because UEI has alleged that Roku has engaged in unlawful and unfair acts in conjunction with its importation, sale for importation, and/or sale after importation of articles into the United States. *See Certain Ammonium Octamolybdate Isomers*, Inv. No. 337-TA-477, Comm’n Op. at 15-16 (Jan. 5, 2004). Personal jurisdiction exists because Roku has appeared and participated in this investigation.

IV. U.S. PATENT NO. 7,589,642

A. Level of Ordinary Skill in the Art

I earlier determined that a person having ordinary skill in the art of the 642 patent at the time of invention “would have a bachelor’s degree in electrical engineering or equivalent degree with two years of work experience relating to communications and consumer electronics.” Order No. 24 at 7. The parties do not challenge this definition (*see CIB* at 9; *see generally RIB*; *RRB*).

B. Claims-at-Issue

Claim 19 is the only claim of the 642 patent remaining at issue in this investigation, either through allegations of infringement or domestic industry economic prong (the domestic industry technical prong was found to be satisfied in Order No. 38). *See CIB* at 12. Claim 19 is reproduced below:

19. A remote control device, comprising:

a keypad;

an RF receiver;

an IR transmitter; and

means for receiving a key code from said RF receiver and for sending said key code to said IR transmitter such that said key code is modulated onto an IR carrier signal, said IR carrier signal with said key code modulated thereon being transmitted from said remote control device by said IR transmitter, wherein said means is a microcontroller.

JX-0002 (642 patent) at cl. 19.

C. Claim Construction

As part of the *Markman* process, the following claim terms of the 642 patent were construed, either as agreed between the parties or determined by Order No. 24:

Claim Term	Construction
key code	A code corresponding to the function of an electronic device, optionally including timing information
means for receiving a key code from said RF receiver and for sending said key code to said IR transmitter such that said key code is modulated onto an IR carrier signal	Not means-plus-function Plain and ordinary meaning

See Order No. 24 at 17, 25.

1. “wherein said means is a microcontroller”

The last term of claim 19 recites “means for receiving a key code from said RF receiver . . . , wherein said means is a microcontroller.” As noted above, I construed the “means for” limitation as not falling under 35 U.S.C. § 112(6), but instead having its plain and ordinary meaning. Order No. 24 at 17, 25. However, during the hearing it became apparent that the final limitation of claim 19, “wherein said means is a *microcontroller*,” needs to be construed.

UEI argues that “a microcontroller” refers to “one or more microcontrollers.” CIB at 14. UEI cites Commission and Federal Circuit precedent for this construction, which is that “[a]s a general rule, the words ‘a’ or ‘an’ in a patent claim carry the meaning of ‘one or more.’” CIB at

14-15, *citing, inter alia, 01 Communique Lab., Inc. v. LogMeIn, Inc.*, 687 F.3d 1292, 1297 (Fed. Cir. 2012); *Certain Automated Media Library Devices*, Inv. 337-TA-746, Rev. Comm’n Op. (Jan 9, 2013) at 41-44. UEI further asserts that the “exceptions to this rule are extremely limited: a patentee must evince a clear intent to limit ‘a’ or ‘an’ to ‘one.’” CIB at 14-15 (quoting *Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342 (Fed. Cir. 2008)). UEI states that in this case, the only evidence to support a finding that the term is limited to a single microcontroller is the claim language itself, and that nowhere do “the claims, specification, or prosecution history ever refer to a ‘single microcontroller.’” *Id.* at 15 (emphasis in original). UEI further argues that the specification contains only “permissive” language that “alone cannot be the ‘clear intent’ necessary to overcome the black letter rule.” *Id.*

UEI is correct that as “a general rule, the words ‘a’ or ‘an’ in a patent claim carry the meaning of ‘one or more.’” *Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342-43 (Fed.Cir.2008). However, the question whether “a” or “an” is treated as singular or plural “depends heavily on the context of its use.” *Norian Corp. v. Stryker Corp.* 432 F.3d 1356, 1359 (Fed.Cir.2005). The general rule does not apply when the context clearly evidences that the usage is limited to the singular. *See Baldwin Graphic*, 512 F.3d at 1344. “While in some instances claim language alone may disclose unambiguously the limits of claim coverage . . . this court seeks the meaning of the claim terms by examining their fuller context.” *Abtox, Inc. v. Exitron Corporation*, 122 F.3d 1019, 1024 (Fed. Cir. 1997) (citation omitted). The written description therefore “supplies additional context for understanding whether the claim language limits the patent scope.” *Id.*

The general rule does not apply. First, the claim recites only one “means” for performing two functions. Specifically, there must be a single means that both *receives* the key code from the

RF receiver *and sends* the key code to the IR transmitter, with the further limitation that the means “is a microcontroller.” The claim language does not preclude other microcontrollers performing other functions, or even performing the same two functions of receiving and sending, but there must be at least one microcontroller that performs those two functions.

Second, nothing in the specification contradicts this conclusion. The specification teaches only that the remote control has a single microcontroller. When describing the remote control, the specification consistently refers to one microcontroller. *See, e.g., JX-0002 (642 patent)* at 3:63-4:3, 6:43-53. In fact, it goes so far as to identify a single specific microcontroller that may be used. *JX-0002 (642 patent)* at 6:52-53 (“for example, a Z8 microcontroller available from Zilog, Inc. of San Jose, Calif”). Moreover, a single microcontroller comports with the invention’s goal of having a remote control that is inexpensive. *See JX-0002 (642 patent)* at 6: 49-50; 9:30-34.

Third, the limitation “wherein the means is a microcontroller” lacks the open-ended term “comprising.” Such claim language indicates that the inventors did not intend “a” to mean one or more. The inventors certainly knew how and when to convey a plurality limitation by using the term “comprising,” as the claims of the 642 patent are replete with that term; however, the term is absent when reciting “a microcontroller.” *See, e.g., Tivo, Inc. v. Echostar Communications Corporation, et al., 516 F.3d 1290, 1304 (Fed. Cir. 2008)* (“although the open-ended term ‘comprising’ is used to refer generally to the limitations of the hardware claims, the ‘assemblies’ limitation itself does not contain that term. Rather, the claim language simply refers to the assembly of two components into ‘an MPEG stream.’”).

Accordingly, the term “wherein said means is a microcontroller” is construed to require a microcontroller that performs both the receiving and sending functions.

D. Infringement

1. Elk Remotes

Roku's Elk Remotes have already been found to infringe claim 19, per Order No. 38. The Commission did not review the order (EDIS Doc. No. 734530). However, as discussed below, claim 19 is invalid under 35 U.S.C. § 103(a).

2. Roku's IR-Only, RF-Only, and Non-Programmable RF/IR Remotes

Roku asks that I make "an explicit ruling" that its IR-Only, RF-Only, and Non-Programmable RF/IR remotes "do not infringe claim 19 because: (a) they are within the scope of the investigation (i.e., they are 'remote control devices'); (b) UEI was on notice of these products because they were included in the parties' representative product stipulation (JX-0323C at 8-10); (c) Roku disclosed its contention throughout this investigation that these remotes do not infringe claim 19 (see RPHB 33), and (d) UEI does not accuse them of infringement and has not presented evidence or argument that they infringe (*see* CPHB 58; RX-0814C at RFA 672, 675, 678, 681, 684, 691 (2nd supp. responses))." RIB at 11-12. Roku does not assert that these particular remotes are redesigns of specific remotes that were included in UEI's complaint and/or listed as accused products by UEI.

UEI argues that Roku's request seeks an inappropriate advisory opinion on products that have not been part of this investigation. I agree. The remotes listed by Roku are not "accused products" and have not been part of this investigation. *See Certain MEMS Devices*, Inv. No. 337-TA-700, Order No. 8 at 6-7 (July 12, 2010) ("While Knowles may be correct that the Notice of Investigation is broad enough to encompass the three processes at issue in this motion, that fact does not necessarily lead to the conclusion that the three processes are, in fact, part of the investigation. The products accused of infringement are determined by the infringement contentions"); *Certain Ceramic Capacitors*, Inv. No. 337-TA-692, Order No. 37 at 4 (June 24, 2010) ("To the extent that Respondents, for their part, seek a determination that their MLCC that

have not been identified as accused products are thereby deemed not to infringe that patent, that determination is not germane to this Investigation”). Roku admits that these three classes of remotes are neither identified as accused products nor redesigned products, and thus, a finding of non-infringement is not proper.

3. Alice Remotes

The Parties agree that the Alice-7 remote is representative of all of the Alice remotes, which include the Alice-2, Alice-4, Alice-6, Alice 7, Alice-8, and Alice-9. Further, the Parties agree that the Alice Remotes satisfy every element of claim 19, except the final clause “wherein said means is a microcontroller.” CIB at 18, RIB at 12. As properly construed, this limitation requires that only one microcontroller performs the claimed function of receiving a key code from the RF receiver and sending the key code to the IR transmitter such that the key code is modulated onto an IR carrier signal, the IR carrier signal with the key code modulated thereon being transmitted from the remote control by the IR transmitter.

Under this claim construction, the Alice Remotes do not infringe claim 19 of the 642 patent because “the Alice Remotes have two microcontrollers – an OZMO 2000 microcontroller and a Texas Instruments (TI) microcontroller.” CIB at 19, *citing* (Tr. (Lipoff) at 543:9-17, 540:23-542:19, 533:10-537:15; see also Tr. (Peters) at 474:9-475:12; 488:3-489:14; JX-0107C (Peters) at 473:1-474:1; RDX-0007C.6-.7 (Lipoff) at 534:8-537:15).

In its Pre-Hearing Brief, UEI argued that the OZMO chip alone performs both of the claimed functions of receiving a key code from the RF receiver and sending the key code to the IR transmitter. CIB at 61. UEI asserted that the TI chip was a “pass-through” for the IR key code. *Id.* UEI appears to have dropped this argument as none of its experts so testified at the hearing and UEI did not present this argument in its post-hearing briefs. Furthermore, Roku’s expert, Mr. Lipoff, testified that the TI chip generates the modulated control signal and sends the IR key code

[REDACTED]

to the IR transmitter “such that said key code is modulated onto an IR carrier signal.” JX-0002 (642 patent) at cl. 19; Tr. (Lipoff) 539:16-540:22; *see also* Tr. (Lipoff) 539:16-540:9; RDX-0007C.11; JX-0324C at Microchip_ITC_INV1200_001116 [REDACTED]

[REDACTED] Tr. (Lipoff) 540:10-22 [REDACTED]

[REDACTED]

[REDACTED]

Accordingly, Roku’s Alice Remotes do not infringe claim 19 of the 642 patent because they do not meet the limitation of using only one microcontroller.

E. Domestic Industry – Technical Prong

By a non-final initial determination (Order No.38), it was summarily determined that claim 19 of the 642 patent is practiced by the domestic industry products. The Commission determined not to review Order 38 on February 19, 2021. EDIS Doc. No 734530. Again, however, claim 19 of the 642 patent is invalid under 35 U.S.C. § 103(a).

F. Validity

Roku asserts that claim 19 of the 642 patent is invalid under 35 U.S.C. § 103(a). *See generally* RIB at 14-28. Roku asserts that U.S. Patent Application No. 2001/0005197 (“Mishra” or “JX-0316”) is prior art to the 642 patent, a point not disputed by UEI. RIB at 15. Mishra is prior art under pre-AIA 35 U.S.C. §§ 102(b) and 102(e) because it was filed on February 17, 2001 and published on June 28, 2001, both more than one year before December 16, 2003, the 642 patent’s priority date. JX-0316; JX-0002. Roku also submits that U.S. Patent No. 8,132,105 (“Dubil” or “JX-0320”) is prior art to the 642 patent, a point also not disputed by UEI. RIB at 16. Dubil is prior art under pre-AIA 35 U.S.C. § 102(e) because it was filed on October 10, 2000, before the December 16, 2003 priority date. JX-0320.

1. Mishra

UEI contends that two issues exist in resolving the validity of claim 19 of the 642 patent: whether Mishra “discloses a remote control that receives a key code over Radio Frequency (RF), as required by Claim 19’s limitation of ‘means for receiving a key code from said RF receiver,’” and “whether a POSITA would have been motivated to combine” Mishra and Dubil. CIB at 20. Roku argues that Mishra discloses all limitations in claim 19 except for the “outputted key code being ‘modulated onto an IR carrier signal.’” RIB at 15. Roku further argues that key codes modulated on an IR carrier signal were well-known and were required for remote controls to control existing devices in the marketplace. *Id.* Thus, Roku reasons, it would have been obvious to implement Mishra’s remote using IR modulation on a carrier signal in the manner claimed, such as disclosed by Dubil. *Id.*

Thus, the Parties’ positions actually are quite similar and focused. The main reference is Mishra, which discloses “a way to program a remote control unit to handle a variety of electronic devices in a fashion which is easy and quick for the user.” JX-0316 at ¶ 5. Fig. 1 of Mishra is reproduced below.

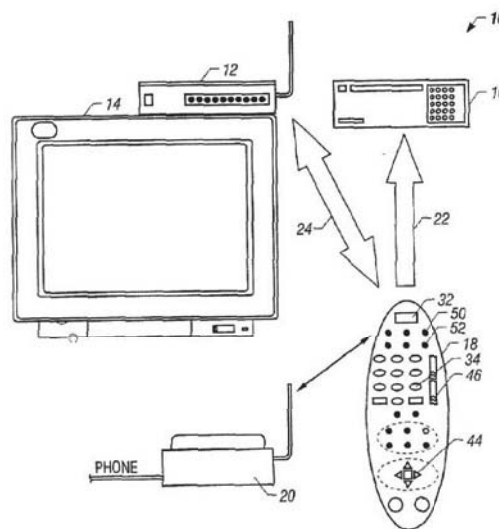


FIG. 1

Figure 1 is a schematic illustration of control system 10, which includes processor-based system 12 in communication with remote control unit 18. JX-0316 at ¶ 14. System 12 may be a set-top computer system that works with a conventional television receiver 14. *Id.* Remote control unit 18 may include display 32, keypad 34, and joy-stick navigational control 44. *Id.* at ¶ 15. In addition, remote control unit 18 may include telephone off-hook button 46 and buttons 50 and 52 that act as “on” and “off” controls for dedicated electronic devices, such as audio/visual receiver 16. *Id.*

Remote control unit 18 may communicate with system 12 using wireless communication such as infrared or radio-frequency links, and system 12 can translate a command signal received from radio control unit 18 into a format appropriate for controlling device 16. *Id.* at ¶¶ 18, 20. “That is, it is not necessary to program [remote control unit 18] independently. Instead a variety of codes may be stored in the system 12.” *Id.* at ¶ 20. Thus, when remote control unit 18 transmits a signal corresponding to a known function, system 12 can translate that signal and send information back to remote control unit 18 to control the particular device that remote control unit 18 is to operate. *Id.* Figure 1 depicts two communication pathways that illustrate this relaying process. Pathway 24 provides bidirectional communication between remote control unit 18 and system 12, and pathway 22 is between remote control unit 18 and device 16. *Id.* at ¶ 34.

For example, if a user presses a button on remote control unit 18, such as a “channel up button,” remote control unit 18 transmits a command to system 12, which receives the signal and “in turn sends [remote control unit 18] the necessary codes to increment the channel on the TV.” *Id.* at ¶ 37. Remote control unit 18 takes these codes and sends them, for example using an IR signal, to the TV using protocols stored in its memory. *Id.*

The particular claim elements of claim 19 of the 642 patent in light of Mishra follows, with particular reference to Fig. 2 of Mishra, which is given below:

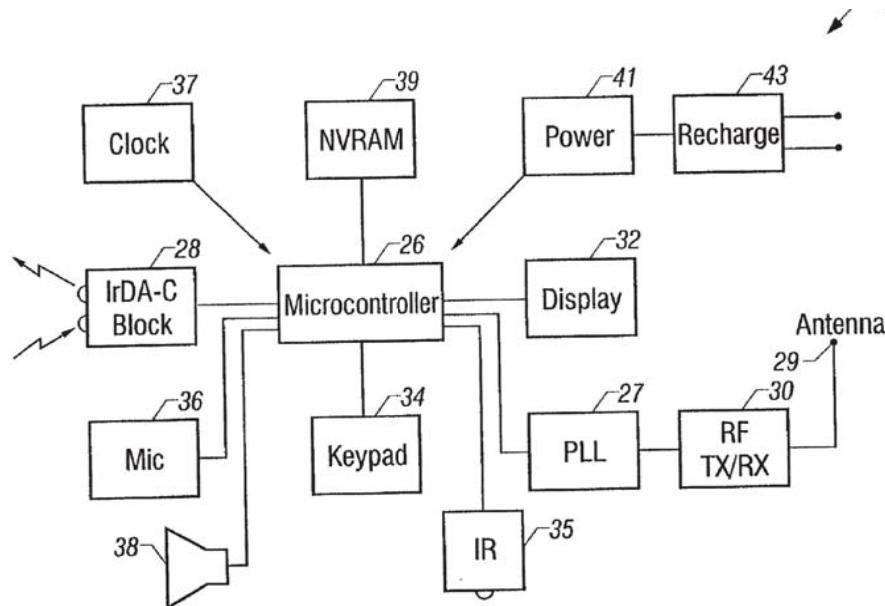


FIG. 2

a. Limitation 19(preamble) – “A remote control device, comprising”

The Parties agree that Mishra’s “remote control unit (RCU) 18” is a remote control device. JX-0316 (Mishra) at Abstract, Fig. 1 (element 18), Fig. 2, ¶¶ 14-15; RIB at 18; Tr. (Russ) at 842:25-843:12; CPHB at 117-119; Tr. (Sprenger) at 1161:23-1162:2.

b. Limitation 19(a) – “a keypad”

The Parties agree that Mishra’s RCU 18 contains “keypad 34.” JX-0316 (Mishra) at Fig. 2 (element 34), ¶¶ 15, 23; RIB at 18-19; Tr. (Russ) at 843:13-843:24 (discussing RDX-0001.29-30); CPHB at 117-119; Tr. (Sprenger) at 1161:23-1162:2.

c. Limitation 19(b) – “an RF receiver”

The Parties agree that Mishra's RCU 18 contains "RF transceiver 30," which includes an RF receiver. JX-0316 (Mishra) at Fig. 2 (element 30), ¶¶ 18, 22; RIB at 19; Tr. (Russ) at 843:25-845:4; CPHB at 117-119; Tr. (Sprenger) at 1161:23-1162:2.

d. Limitation 19(c) – "an IR transmitter"

The Parties agree that Mishra's RCU 18 contains "IR transmitter 35." JX-0316 (Mishra) at Fig. 2 (element 35), ¶¶ 22, 37; RIB at 19; Tr. (Russ) at 845:5-846:1; CPHB at 117-119; Tr. (Sprenger) at 1161:23-1162:2.

e. Limitation 19(d) – "means for receiving a key code from said RF receiver and for sending said key code to said IR transmitter such that said key code is modulated onto an IR carrier signal, said IR carrier signal with said key code modulated thereon being transmitted from said remote control device by said IR transmitter, wherein said means is a microcontroller."

(i) Remote control "Receiving a Key Code From Said RF Receiver"

Mishra discloses microcontroller 26 that receives signals from RF transceiver 30 via phased lock loop 27, or from IR transceiver 28, and then forwards signals to IR transmitter 35, which transmits the signals to "legacy devices 16." JX-0316 at Fig. 2; ¶¶ 22, 25. The signals the microcontroller receives and sends carry the "necessary codes to control the devices," that is, key codes. *Id.* at ¶¶ 37, 38. So most of this element is expressly disclosed in Mishra.

UEI argues that Mishra does not disclose a remote control "receiving a key code from said RF receiver." CIB at 21. Instead, UEI argues, Mishra shows "that the remote control can receive *some type* of communication over RF," but fails to "expressly or clearly disclose receiving key codes over RF." *Id.* at 23 (emphasis in original), *citing, inter alia*, JX-0316 (Mishra) at ¶¶ 18, 22, 37). UEI argues that the three paragraphs disclosing RF communications in Mishra "do not expressly or clearly disclose receiving key codes of RF," and thus Mishra's disclosure is "insufficient." *Id.* Moreover, UEI argues that paragraph 18 of Mishra fails to present clear and

convincing evidence that RCU 18 can receive key codes over RF. CIB at 22. UEI suggests that the use of “or” when describing how the RCU communicates with system 12 is mere speculation that the teaching actually means that “Mishra’s specification [teaches that] it could use infrared or radio frequency.” *Id.* at 24. Furthermore, UEI asserts that “the only communication method [taught in Mishra] for key codes is infrared (IR).” *Id.*

I disagree. Paragraph 18 of Mishra expressly discloses communications between system 12 and the remote control (RCU 18) that occur exclusively via RF. Paragraph 18 states, “RCU 18 may communicate with the system 12 using wireless communication such as infrared *or radio-frequency links*.” JX-0316 (Mishra) at ¶ 18 (emphasis added). The experts acknowledged that Mishra teaches that the RCU can receive the key codes via the RF receiver. Tr. (Russ) at 844:16-845:4, 848:9-849:9; Tr. (Sprenger) at 1167:20-1168:2. UEI’s argument ignores the well-established meaning and use of the word “or” to indicate alternatives. *See SkinMedica, Inc. v. Histogen Inc.*, 727 F.3d 1187, 1199 (Fed. Cir. 2013) (“The disjunctive ‘or’ plainly designates that a series describes alternatives.”); *Schumer v. Lab. Comput. Sys., Inc.*, 308 F.3d 1304, 1311 (Fed. Cir. 2002) (“We have consistently interpreted the word ‘or’ to mean that the items in the sequence are alternatives to each other.”). In sum, Mishra teaches that the remote controller is capable of communicating with the system 12 using RF links.

Moreover, Mishra teaches key codes being transferred to the RCU as “signals,” “codes,” and/or “information” that are sent via IR or RF. *See, e.g.*, JX-0316 (Mishra) at ¶¶ 18 (RCU 18 may communicate with the system 12 using wireless communication such as infrared or radio frequency links”); 20 (“a variety of codes may be stored in the system 12. . . the system 12 can translate the signal and send information back to the RCU 18 to enable the RCU 18 to control the particular device the RCU 18 is to operate); 34 (“the appropriate signal information is sent to the

RCU 18 by the system 12 . . . In other words, the RCU 18 may be provided with protocols to control a given device,”); 37 (“When the TV button is pushed, the appropriate commands are sent to the master [which may be system 12, (¶ 26)] informing the master that the user now wishes to control the TV. The next button that is pushed, foreexample, the channel up button, causes the appropriate command to be sent to the master telling it, for example, that the user wishes to go to the next highest channel. The master in turn sends the RCU the necessary codes to increment the channel on the TV.”). In fact, claim 12 of Mishra covers communication between system 12 and RCU 18 using both RF and IR. *See* JX-0316 (Mishra) at cl. 12. Mishra provides no indication that the communication between system 12 and the RCU is only IR. *See also* Tr. (Russ) at 840:17-841:3, 844:23-845:4; 848:9-850:4, 947:8-12; Tr. (Sprenger) at 1166:16-1167:14.

(ii) Mishra Does Not Limit Use of RF to Telephone Functionality

UEI further argues that “Mishra explicitly show[s] that RF is used only for the cordless home telephone communications, not key code applications.” CIB at 23. According to UEI, “the only express disclosure in Mishra is that RF communication is for telephone communication [and] the only communication method for key codes is infrared (IR).” *Id.* This argument fails for the same reason as given above – Mishra presents this functionality as one possible feature and not the only one. *See* JX-0316 (Mishra) at ¶¶ 18, 20.

UEI further argues that “the telephone functionality in Mishra is a core teaching” and thus, the telephone functionality is not optional. CIB at 26. In other words, Mishra’s teachings relate solely to “adding telephone functionality to a remote control.” *Id.*, *citing* Tr. (Sprenger) at 1120:10-13, 1122:2-1123:3. But UEI’s argument, that the use of “may” in this context is not optional, is contrary to the law. *In re Johnston*, 435 F.3d 1381, 1384 (Fed. Cir. 2006) (the word

“may” indicates “optional elements”). While Mishra’s Abstract and claims relate to telephone functionality, the entire specification is not so limited, because it also discusses controlling other electronic devices. *See, e.g.*, JX-0316 (Mishra) at ¶¶ 19, 20, 26-34, 36-39. Moreover, as Roku points out, “it is well-established that the specification of a prior art patent or patent application can contain a broader disclosure than its claims.” RIB at 21-22, *citing In re Rasmussen*, 650 F.2d 1212, 1214 (CCPA 1981) (“Disclosure is that which is taught, not that which is claimed.”); *In re Lemelson*, 397 F.2d 1006, 1009 (CCPA 1968) (“The use of patents as references is not limited to what the patentees describe as their own inventions.”); Tr. (Russ) at 988:22-23.

(iii) Mishra’s Phase Lock Loop and “Powered Down” Features

Mishra teaches that a phase lock loop may be used to tune the RF transceiver to a particular wireless telephone technology. JX-0316 (Mishra) at ¶ 24. UEI’s expert testified that this teaching illustrates Mishra’s remote control does not receive key codes via RF, because a PLL is a circuit that can lock onto a specific frequency and obtain a precise lock and Mishra does not disclose anything about using that for sending key codes to a remote control using RF. *See* Tr. (Sprenger) at 1198:21-1199:3; JX-0316 (Mishra) at ¶ 24 (“A phase locked loop device 27 may be used”). But as noted, this is not Mishra’s only teaching, so it is irrelevant that Mishra discloses tuning via phased lock loop.

UEI’s expert also testified that Mishra’s disclosure of powering down unused systems illustrates that Mishra’s remote control does not receive key codes via RF. *See* Tr. (Sprenger) at 1135:23-1136:13 (“you could not receive key codes via RF and then send them out via IR if the RF is turned on and IR module is turned off.”). This, too, is irrelevant. The actual teachings in Mishra are that certain features may be powered down when not in use during a telephone communication in order to save power. *See* JX-0316 (Mishra) at ¶¶ 23, 42. These features are not

relevant to the other embodiments of Mishra discussed above related to controlling other electronic devices.

Accordingly, Mishra teaches all limitations in claim 19 except for “outputted key code being modulated onto an IR carrier signal.”

2. U.S. Patent No. 8,132,105 to Dubil

Fig. 1 of Dubil is shown below:

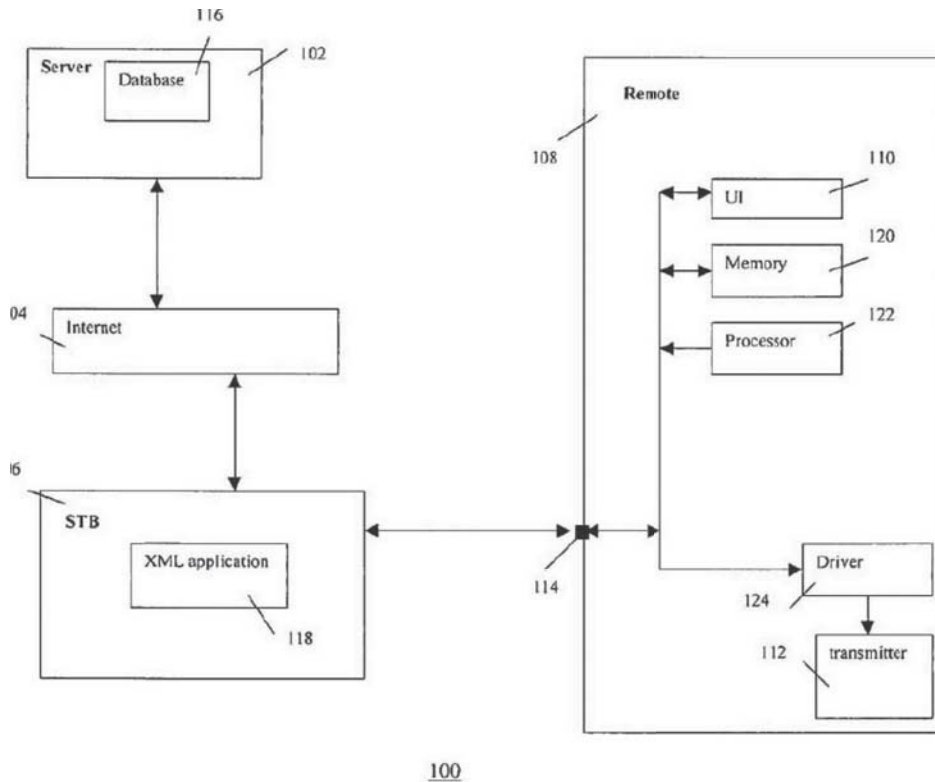


Fig.1

Dubil “relates to remote control devices and to a service for enabling the programming of remote controls to be used with consumer electronics (CE) equipment.” JX-0320 (Dubil) at 1:6-8. As shown in Fig. 1, system 100 comprises server 102 connected via Internet 104 to appliance 106, such as a set-top box or personal computer, at a user’s home. *Id.* at 4:48-51. Server 102 includes database 116, which maintains an inventory of control codes for commercially available consumer electronics equipment of various brands and types. *Id.* at 4:60-62. The user has a

“universal programmable remote control device 108,” which includes transmitter 112 for sending control codes to electronics equipment, such as TVs, VCRs, CD players, set-top boxes, DVD players, audio pre-amplifiers, and tuners. *Id.* at 4:51-57. Input 114 of remote control device 108 allows for communication with appliance 106. *Id.* at 4:57-59. In operation, “[t]he user requests via appliance 106 a code set from server 102 for control of the apparatus, type, brand, serial no., etc., as specified by the user and to be controlled via remote 108.” *Id.* at 5:6-8. The codes maintained in database 116 are formatted as XML (Extensible Markup Language) documents such that “relevant parameters of a particular control code or command are defined using XML tags.” *Id.* at 4:64-66. “For example, tags are defined for the relevant controllable apparatus to which a code pertains, for its type number, for the IR or RF carrier frequency, for the duty cycle, the protocol type, for the repetition time, for the on/off times of the signal, etc.” *Id.* at 4:66-5:3. Notably, Dubil also discloses different “protocol[s]” that may be used in transmitting control codes, including “PWM.” *Id.* at 4:33-37.

3. Discussion

Determining whether claim 19 of the 642 patent is invalid requires consideration of the Graham factors: (1) the scope and content of the prior art, (2) the level of ordinary skill in the art, (3) the differences between the claimed invention and the prior art, and (4) objective indicia of non-obviousness. *Scanner Techs. Corp. v. ICOS Vision Sys. Corp. N.V.*, 528 F.3d 1365, 1379 (Fed. Cir. 2008). UEI offers no objective indicia of non-obviousness, and as noted, the differences between claim 19 and Mishra are small. *See* CIB at 26-27. The prior art contains all the elements of claim 19, with Dubil supplying the one element missing from Mishra: a key code modulated onto a carrier signal. JX-0002 (642 patent) at cl. 19. Moreover, a skilled artisan would undoubtedly have been familiar with various modulation schemes, and the 642 patent itself

suggests that “modulat[ion] onto carrier signals” was a known method of “generat[ing] key code signals.” *Id.* at 1:38; *see* Tr. (Russ) at 842:9-19.

UEI submits that one skilled in the art would not have been motivated to combine Mishra and Dubil because “Mishra’s and Dubil’s teachings would have required a POSITA to use the unjustifiably complicated XML ‘container’ [of Dubil] to transport key codes from the [set-top box] to the remote control” and “Dubil’s XML container does not make sense in the context of the 642 patent, where extensive codesets are *not* stored on the remote control.” CRB at 13 (emphasis in original). UEI asserts that the combination would have been “needlessly complex [and] expensive,” and would have “required a POSITA to complicate Mishra further by using Dubil’s teachings of an XML container, a more powerful processor, and a driver, which a POSITA would not have done.” CRB at 14.

UEI’s argument is beside the point. Roku cites Dubil not for its XML disclosure, but “for its disclosure about storing, transferring, and using information about modulation, and then taking the information about modulation and using it to actually perform modulation.” Tr. (Russ) at 842:4-8; *id.* at 870:10-12. That disclosure is what one skilled in the art would know to apply to the teachings of Mishra to accomplish the function of claim 19 of the 642 patent. The prior art need not serve precisely the same purpose as that disclosed in the challenged patent’s specification to support the conclusion that the claimed subject matter would have been obvious. *See In re Lintner*, 458 F.2d 1013, 1016 (CCPA 1972) (question is merely whether the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art to make the proposed substitution, combination or other modification); *see also KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 419 (2007) (“neither the particular motivation nor the avowed purpose of the patentee controls”). UEI improperly focuses on the Dubil teachings related to an XML container,

and therefore allegedly incompatible with Mishra, instead of Dubil's narrow teachings related to modulation. *See Orthopedic Equip. Co. v. United States*, 702 F.2d 1005, 1013 (Fed. Cir. 1983) ("There is a distinction between trying to physically combine the two separate apparatus disclosed in two prior art references on the one hand, and on the other hand trying to learn enough from the disclosures of the two references to render obvious the claims in suit.").

Lastly, in its Final Written Decision ("FWD") for each of the Inter Partes Reviews for the 642 patent and for a continuation patent, U.S. Patent No. 8,004,389 ("the 389 Patent"), the U.S. Patent Office determined that Dubil taught "different modulation schemes that may be used in transmitting control codes having different bit patterns, including frequency-shift keying ('FSK'), binary phase-shift keying ('BPSK'), and pulse-width modulation ('PWM')." *See* RX-1587 at 33 (FWD for IPR2019-01612 (the 642 patent) (March 29, 2021)) and RX-1588 at 37 (FWD for IPR 2019-01613 (March 29, 2021)), *citing* Dubil at 4:33-37. The Patent Office further found that it would have been obvious to one skilled in the art to combine Mishra and Dubil for modulation. *See* RX-1587 at 42; RX-1588 at 50. That is, inasmuch as Dubil does not expressly use the term "modulation," it nonetheless would have been clear to a POSITA that Dubil teaches modulation methods, including, for example, pulse width modulation. JX-0320 (Dubil) at 4:37 (reciting "PWM").

Therefore, in view of the Graham factors, claim 19 of the 642 patent is invalid as being unpatentable under 35 U.S.C. § 103(a) over Mishra and Dubil.

V. U.S. PATENT NO. 10,600,317

A. Level of Ordinary Skill in the Art

A person having ordinary skill in the art of the 317 patent at the time of invention "would have had a bachelor's degree in electrical engineering, computer science, or equivalent degree with

two years of work experience relating to communications or consumer electronics.” Order No. 24 at 7.

B. Claims-at-Issue

Claims 3, 6, 9, and 11 of the 317 patent are at issue in this investigation, either through allegations of infringement or of the domestic industry technical prong. CIB at 4. All of these claims depend directly from claim 1:

1. A controlled device, comprising:
a receiver for receiving communications from a remotely located controlling device;
a transmitter for transmitting communications to a display device coupled to the controlled device;
a processing device coupled to the receiver and the transmitter; and
a memory storing executable instructions, wherein the instructions, when executed by the processing device, cause the controlled device to:
automatically progress through a plurality of setup procedure steps in response to each of a plurality of communications received via use of the receiver from the controlling device;
transmit to the display device via use of the transmitter communications to cause the display device to display instructional information to a user while progressing through the plurality of setup procedure steps; and
in response to at least a type and brand of a target device to be controlled via use of the controlling device being identified via use of the plurality of setup procedure steps, select at least one command code set which has been predetermined to be likely to be usable by the controlling device to control operational functions of the target device when subsequently provisioned to the controlling device.
3. The controlled device as recited in claim 1, wherein the at least one command code set comprises an infrared command code set.
6. The controlled device as recited in claim 1, wherein the instructions cause the controlled device to exit the plurality of setup procedure steps in response to a predetermined communication being received via use of the receiver from the controlling device.
9. The controlled device as recited in claim 1, wherein the instructional information being displayed by the display device comprises a series of displayed navigable menus.
11. The controlled device as recited in claim 1, wherein the controlled device comprises a transceiver coupled to the processing device for receiving the executable instructions from a remote server for storage in the memory.

317 patent at cls. 1, 3, 6, 9, and 11.

C. Claim Construction

No claims of the 317 patent that remain asserted were construed earlier. CIB at 80. Now, however, UEI submits that the “primary dispute” between the parties is the construction of three limitations of claim 1. CIB at 78, 80-81. These are (with identifiers added):

- 1(e) automatically progress through a plurality of setup procedure steps in response to each of a plurality of communications received via use of the receiver from the controlling device;
- 1(f) transmit to the display device via use of the transmitter communications to cause the display device to display instructional information to a user while progressing through the plurality of setup procedure steps;
- 1(g) in response to at least a type and brand of a target device to be controlled via use of the controlling device being identified via use of the plurality of setup procedure steps, select at least one command code set which has been predetermined to be likely to be usable by the controlling device to control operational functions of the target device when subsequently provisioned to the controlling device

1. Limitation 1(e)

UEI argues that the construction of limitation 1(e) is the plain and ordinary meaning, when “read and considered together [with 1(f)], and in light of the specification.” CIB at 81. UEI asserts that when so read, the claimed “plurality of setup procedure steps” requires that an actual procedure be accomplished at each step – for instance, “the entry or provisioning of a code in order to test or confirm that the code set is likely to work.” CIB at 81. Thus, according to UEI, element 1(e) requires a plurality of setup procedure steps; and while a user prompt (for example an inquiry of the type and brand of device to be controlled) is *part* of a procedure step, a prompt *alone* is not a procedure step and/or two user prompts is not a plurality of setup procedure steps. CIB at 82. Thus, UEI asserts that the steps of selecting a device type, then selecting a device brand, and then displaying a set-up code comprise only a single procedure step. *Id.* (“While user prompts

(including for a type and a brand) can be part of any given procedure step, there is nothing in the claim or specification suggesting that a user prompt alone is a procedure step or that two user prompts is a plurality of setup procedure steps”). UEI further submits that the “automatically progress” term should be construed to be “the use of *multiple*” setup procedure steps, as shown in the bottom of Figure 7 to, for example, iteratively test or verify different code sets, and the instructional information is used to guide the user through that exact process. CRB at 47; JX-0004 at Fig. 7.

Roku also argues that limitation 1(e) should be given its plain and ordinary meaning; however, Roku submits that UEI’s construction of element 1(e) is not the “plain and ordinary meaning” because it adds the limitation that a code set must be tested as part of the “automatic progress through a plurality of setup procedure steps.” RIB at 78. Roku argues that UEI is “deliberately vague” about exactly what the term means, and in any event UEI incorrectly argues that the “plurality of setup procedure steps” includes only the “iterative procedure steps, used to test or confirm the codes,” and not the steps of selecting type or brand, or displaying a setup code, of a target device. RRB at 41, *citing* CIB at 84.

Roku’s position is more compelling. UEI’s construction is overly complicated and supported neither by the ’317 specification nor its own expert. For example, UEI’s assertion that the term “setup procedure steps” does not include a prompt alone (for example an inquiry of the type and brand of device to be controlled) is directly contradicted by its own expert, Dr. Rosenberg:

Q. Dr. Rosenberg, the ’317 patent describes a setup process, correct?

A. Yes, it does.

Q. And that setup process involves a plurality of setup procedure steps, correct?

A. Yes, it does.

Q. And those setup procedure steps may include screens prompting the user information input to identify device type and brand information, correct?

A. Yes, it does.

Tr. (Rosenberg) at 1308:8-17.

As another example, the specification does not support UEI's position that a prompt to the user does not amount to a setup procedure step, or that the steps of selecting a type, selecting a brand, and displaying a set-up code comprise only a single set-up procedure step. Fig. 7 of the 317 patent describes "in flowchart form, a summary of the steps described below [for setup] and illustrated in FIGS. 4 through 6." JX-0004 (317 patent) at 5:12-16. Figs. 4 and 7 illustrate the step of selecting a brand, *id.* at 4:20-5:53, and Figs. 5 and 7 illustrate the step of displaying a set-up code, *id.* at 54-56. Figs. 6 and 7 illustrate the testing of the operation to determine if the code works. *Id.* at 5:64-76.3. Each of these are described as separate setup procedural steps and displayed as such in the flow chart of Fig. 7 as separate boxes.

Finally, claim 1 itself recites that selecting a type and brand comprise a "plurality" of setup procedure steps. Limitation 1(g) recites, in part, "in response to at least a type and brand of a target device . . . being identified via use of the plurality of setup procedure steps." Thus, the claim recites that a "plurality of setup procedure steps" can include a plurality of such steps to identify "a type and brand of a target device."

Therefore, limitation 1(e) is construed as possessing its plain and ordinary meaning, wherein an individual step can consist of a selection of an individual type or brand.

2. Limitation 1(f)

UEI asserts that this term, like 1(e), is the plain and ordinary meaning, when "read and considered together [with term 1(e)], and in light of the specification." CIB at 81. Within element 1(f) is the term "instruction information," and it is this term where the parties' definition differs. UEI defines "instruction information" as a "true instruction, for example, an instruction to point the remote at the target device or to enter a code into the remote." *Id.* at 82. UEI asserts that "the specification specifically calls questions to a user about the type or brand of the target device 'user

prompts’ (Tr. (Rosenberg) at 1260:18-1261:6). In contrast, the specification reserves the word ‘instructions’ to discuss times where the user must actually take an action or perform a task, like pointing the remote at the target device or entering a test code into the remote (*id.*).” CRB at 47, *citing* Tr. (Rosenberg) at 1260:18-1261:6).

Roku also argues the element should be given its plain and ordinary meaning, but that UEI improperly imports a “testing” requirement into its construction “by asserting that ‘[i]n the claim, the user is provided instruction information . . . (which the specification teaches is used for the purpose of testing a code).’” RRB at 42, *citing* CIB at 82. Roku further asserts that the plain and ordinary meaning of “instructional information” is not restricted to information displayed in testing steps and improperly excludes information displayed in other set-up procedure steps. *Id.*

The specification does not limit the meaning of “instruction information” in the manner that UEI asserts. A directive to select a type or brand of target device fits comfortably within the plain and ordinary meaning of “instruction.” Granted, the specification occasionally uses the terms “instructions and prompts” when discussing the relevant portion of the set-up procedure, but the terms are not used separately to signify different operations. But for the most part, the specification uses the term “prompt” when referring to either of UEI’s scenarios. *See, e.g.*, JX-0004 (317 patent) at 5:20-21 (“application 406 may also prompt the user to select an appropriate language”); 6:37-39 (using a TV screen to “present prompts such as ‘Did your DVD player respond to the Power On command? Press ‘1’ for yes, or press ‘0’ for no’”); 7:9-10 (“application 406 may interactively prompt the user to enter information regarding device usage”); 7:48 (“user may be prompted 806 to specify a device to be used”).

Therefore, limitation 1(f) possesses its plain and ordinary meaning, and the term “instruction information” specifically is construed as encompassing user prompts to select a target

device's brand or type.

3. Limitation 1(g)

UEI asserts that this limitation should be given its plain and ordinary meaning, “in light of the proper context provided by the specification.” CIB at 92. Specifically, UEI argues that the limitation “requires that the command code set be predetermined to be likely to work with *the target device* itself, not some general device of the same type and brand.” *Id.* (emphasis in original). In other words, the plain and ordinary meaning is “that the controlled device . . . select[s] the command code set that it has predetermined is likely to be usable (by the controlling device) to control operational function of the target device (as opposed to a general device of a certain type and brand) when subsequently provisioned to the controlling device.” CIB at 93.

Roku argues that UEI's interpretation is not the plain and ordinary meaning because UEI's construction “import[s] a limitation from the specification – that the claim requires testing.” RIB at 80. According to Roku, “the dispute regarding limitation 1(g) boils down to one word—‘likely’—in the phrase ‘predetermined to be likely to be usable’ to control the target device. UEI argues that the use of ‘likely’ means that limitation 1(g) covers only testing steps, and not the steps of selecting type and brand.” RRB at 43-44.

The disagreement actually revolves around the words “predetermined to be likely.” UEI asserts that the claim requires that the command code set be predetermined to be likely to work with the specific target device itself, as opposed to a device of the same type and brand. CIB at 92. But the specification describes the process as retrieving a command code that is “predetermined” (i.e., without actual testing) to be “likely” (i.e., the possible code is narrowed down from the universe of all possible codes) to work with the type and brand selected by a user:

CONFIDENTIAL MATERIAL OMITTED

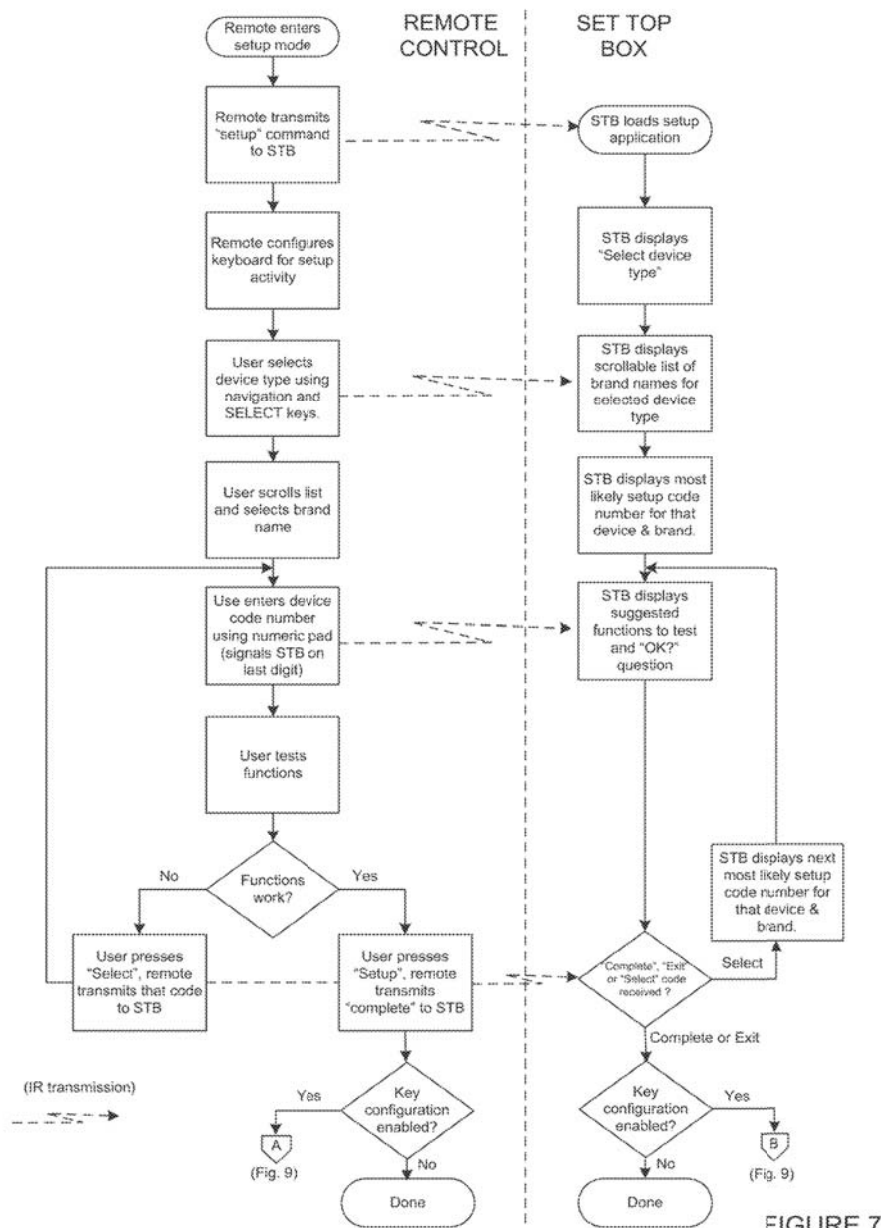


FIGURE 7

JX-0004 (317 patent) at Fig. 7.

Upon initiation of setup the user is asked “what device do you want to setup for control?” and is given a list of devices (such as TV or DVR) to choose from (JX-0004 (317 patent) at 5:15-20); the user selects the type of device, and is asked to select the brand name of the device (*id.* at 5:31-34). The user then selects the brand and is shown a display of “the remote control setup code

number most likely to result in selection of an infrared code set which will operate appliances of the type and manufacture indicated” (*id.* at 5:42-47); the user enters the code number, and the remote control transmits an infrared command that corresponds to the user’s choice of code number (*id.* at 5:54-62). After the remote transmits the code, it is tested to determine if the code actually controls the device. Neither the specification nor claim 1 specify that the code number input by the user is likely to be usable by the specific target device. Instead, the process taught and claimed is a system that selects a “likely” command code set by narrowing the number of possible codes based on a type and brand of target device, without testing the code set. Tr. (Balakrishnan) at 707:8-709:1; RDX-0004C.49; *see also* Tr. (Rosenberg) at 1301:16-21. The “predetermined” nature of the code is that the code is obtained by reference to data 404, which is stored locally on the set top box or another memory that is accessible by the set top box, and which is “periodically updated.” JX-0004 (317 patent) at 4:28-36; 5:44-48.

Therefore, limitation 1(g) is construed to have its plain and ordinary meaning, in particular that a command code set is predetermined to be likely to be usable based only on the type and brand of device selected by the user, without further specificity and without testing of the code set.

A final point on claim construction. UEI argues that its proposed construction of these elements is correct because the examiner would not have allowed the claims over the disclosed prior art if these limitations were construed to have simply their plain and ordinary meaning. CIB at 89-91. During prosecution of the 317 patent, UEI filed an Information Disclosure Statement, listing the SVR-2000 Setup Guide, which Roku does not dispute is almost identical to the SVR-3000 Setup Guide. But the Information Disclosure statement contained almost 40 other references, and there is no evidence the SVR-2000 Setup Guide was ever substantively discussed during

prosecution. CX-0152C.0070-75. Therefore, this reference is not germane to the claim construction.

D. Infringement

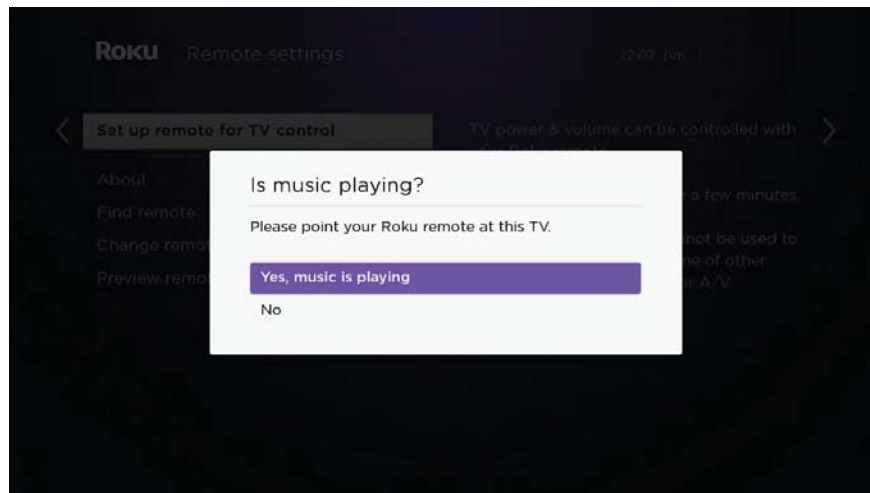
UEI asserts that the Roku Ultra, Streaming Stick+, and Soundbar (collectively the “Roku 317 Accused Players”) directly infringe claims 3, 6, 9, and 11 of the 317 patent. CIB at 93. Each of the asserted claims depend from independent claim 1, and thus, the Roku 317 Accused Players also must meet each limitation of claim 1.

1. Overview of Functionality

The Roku Soundbar will configure itself and its included remote to control the power on and power off functionality of the attached TV. The Roku Ultra and Soundbar control the TV via CEC over the HDMI connection or IR commands from the Roku remote directly to the TV.

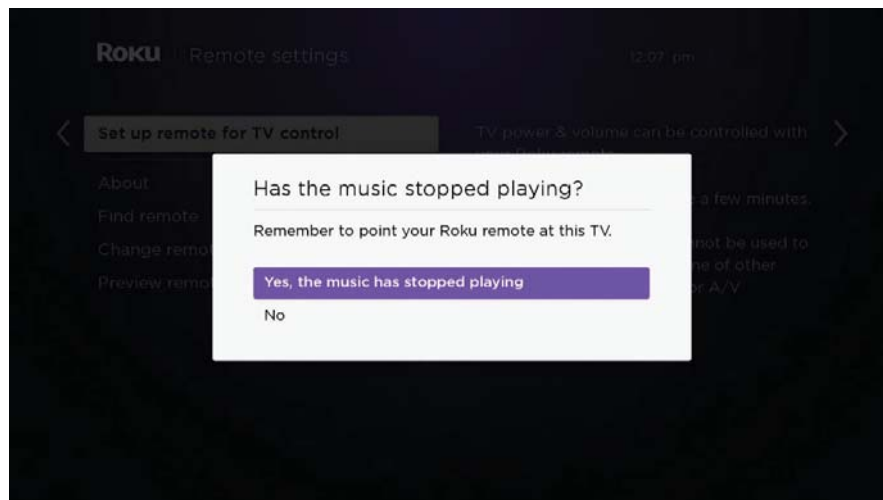
Roku Ultra and Roku Streaming Stick+

The Roku Ultra and Roku Streaming Stick+ configure themselves and their included remote to control the power on, power off, volume up, volume down, and mute operations of the TV attached to the Roku. JX-0024; *see generally* Tr. (Rosenberg) at 105:24 -120:16. For the Roku Ultra, remote control programming starts by selecting the “Set up remote for TV control” feature in the Remote Settings menu. JX-0024; Tr. (Rosenberg) at 106:15-22. The setup procedure initially uses the [REDACTED] to identify the brand of the TV. CPX-0115C at ROKU_ITC_SC_0000449. After this feature is initiated, information appears on the television, such as “[p]lease point your Roku remote at this TV” (CIB at 98), and then the user is asked “is music playing,” and the user can select “Yes, music is playing” or no. JX-0024.



CPX-0106; CDX-0002C.7.

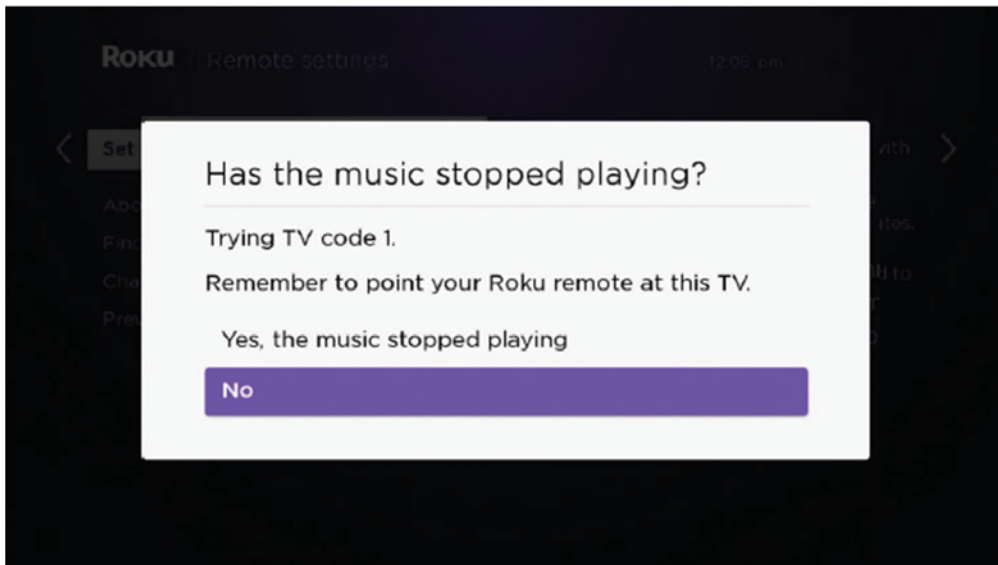
If the user selects “Yes, music is playing,” the Roku Ultra sends a mute command to the TV via CEC over the HDMI connection; the Roku Streaming Stick+ operates like the Ultra, except that it controls the TV only via IR. Tr. (Rosenberg) at 109:5-16. The next screen asks if the music has stopped playing:



Id.; CPX-0106; CDX-0002C.8.

If the user selects “Yes, the music has stopped playing,” the Roku Ultra is configured to use CEC to control power on, power off, volume up, volume down, and mute. Thus, if a user presses one of those control buttons on the Roku remote, the corresponding command will be

transmitted from the Roku Ultra to the TV via CEC. Tr. (Rosenberg) at 109:17-110:15. However, if the user selects “no,” the music did not stop playing, the Roku Ultra configures the Roku remote to control the TV via IR. In this case, the Roku Ultra sends data to the Roku remote that causes the Roku remote to transmit the first IR mute command associated with the detected brand of the attached TV. Tr. (Rosenberg) at 110:16-111:19. The user is then presented with a variation of the same basic question as before:



Id.; CPX-0106; CDX-0002C.11.

If the music stops, the user selects the “yes” option, and the Roku Ultra finalizes configuration of the Roku remote to transmit the IR commands for power on, power off, volume up, volume down, and mute. If the music does not stop (indicating that the command was unsuccessful), the Roku Ultra automatically transmits the next IR mute command associated with the detected brand of the TV. Tr. (Rosenberg) at 111:5-113:19. This process continues until there is either a successful command or there are no more code sets to try for the detected brand. *Id.* If all of the code sets for a given brand are unsuccessful, the user can either exit the process or manually enter a brand and begin the testing process again with the code sets for that brand.

Roku Soundbar

The Roku Soundbar operates similarly to the Roku Ultra with respect to the “Set up remote for TV control” functionality. Tr. (Rosenberg) at 120:4-16. However, the Roku Soundbar tests the power functionality of the TV instead of testing a mute command. *Id.*

2. Claim 1 of the 317 Patent

The Parties agree that the Roku 317 Accused Players meet the limitations of 1(a) – 1(f) (using the same identifiers as were used for the claim construction discussion). Thus, the only limitation for which there is disagreement is 1(g). In order to fully appreciate the recitation of 1(g) however, limitations 1(e) and 1(f) also must be discussed. Again:

- 1(e) automatically progress through a plurality of setup procedure steps in response to each of a plurality of communications received via use of the receiver from the controlling device;
- 1(f) transmit to the display device via use of the transmitter communications to cause the display device to display instructional information to a user while progressing through the plurality of setup procedure steps;
- 1(g) in response to at least a type and brand of a target device to be controlled via use of the controlling device being identified via use of the plurality of setup procedure steps, select at least one command code set which has been predetermined to be likely to be usable by the controlling device to control operational functions of the target device when subsequently provisioned to the controlling device

UEI argues that the Roku 317 Accused Players meet limitations 1(e) – 1(g) because each Player (the controlled device) selects a command code set [REDACTED] via the use of the automatic setup procedure discussed above (limitation 1(e)). CIB at 99. UEI asserts that by “invoking the setup procedure to configure the remote [which is the controlling device], the type of the device is identified to be a TV (Tr. (Rosenberg) at 153:24-154:23). Additionally, the setup procedure initially and automatically uses [REDACTED] to identify the brand of the TV using [REDACTED] (CPX-0115C at

[REDACTED]

ROKU_ITC_SC_0000449).” *Id.* Instructional information is displayed to the user during the setup, such as instructing the user to test whether sound is on or off and/or whether the power is on or off, depending on the particular Roku device (limitation 1(f)). CIB at 97-98. Finally, the Roku Players select one command code set that has been predetermined to be likely to be usable based on the automatic procedure steps. CIB at 99.

Roku, on the other hand, argues that the Accused Products do not meet the limitation of 1(g) because they do not identify the type of target device to be controlled via the setup procedure steps. Roku submits that the Roku 317 Accused Players [REDACTED] [REDACTED] RIB at 81, *citing* Tr. (Balakrishnan) at 686:14-687:6. Roku further argues that the Roku 317 Accused Players fail to select at least one command code set because the products [REDACTED]

[REDACTED] RIB at 82. Roku submits that the remote controls [REDACTED] [REDACTED] *Id.* And Roku asserts that a code set “is the set of all the codes for a particular device.” *Id.* at 83.

The evidence shows that limitation 1(g) is met. A user’s initial selection of the command “Set up remote for TV control” feature in the remote control Remote Settings menu is a “communication received via the use of the receiver from the controlling device.” Once the Roku 317 Accused Players receive this communication, a TV is by definition selected. Further, it is this selection of “set up the remote” that begins the automatic progression through a plurality of setup procedure steps, as recited in element 1(e). There is nothing in the asserted claims that recite that there must be more than one device to be controlled – just that the user must choose a device, which is accomplished by entering the set up mode. Once the mode is selected, the Roku 317 Accused Players automatically progress through a plurality of setup procedure steps by [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] These are a plurality of setup procedure steps, which meets the limitation of claim 1(f).

Finally, element 1(g) is met since at least one command code set “likely to be usable” is selected when the Roku 317 Accused Players automatically progress through the set up steps to determine that a television has been selected and the particular brand is determined. Moreover, the term “command code set,” although it has not been formally construed, plainly does not mean every function of the television must be part of the code that is selected and provisioned to the remote control. In fact, the 317 patent does not define the term command code set beyond being codes that “will operate appliances.” JX-0004 (317 patent) at 5:46. The code sets used by Roku 317 Accused Players operate functions of the television, which is consistent with the specification. And UEI has not “acknowledged” that “command code set” means all the codes for a particular device; that UEI’s counsel took that position in oral argument regarding a different patent is irrelevant. *See* RIB at 83.

Accordingly, the Roku 317 Accused Players meet every limitation of claim 1 of the 317 patent. Claims 3, 6, 9, and 11, which all depend from claim 1, are the claims of the 317 patent that are asserted against Roku. The evidence shows that the Roku 317 Accused Players infringe these claims.

3. Claim 3: the controlled device as recited in claim 1, wherein the at least one command code set comprises an infrared command code set.

Roku does not dispute that Roku 317 Accused Players select an infrared command code set to provision to the Roku remote. *See* Tr. (Rosenberg) at 160:11-15; CPX-0115C at ROKU_ITC_SC_0000076. Thus, the Roku 317 Accused Players satisfy the limitations of Claim 3.

- 4. Claim 6: The controlled device as recited in claim 1, wherein the instructions cause the controlled device to exit the plurality of setup procedure steps in response to a predetermined communication being received via use of the receiver from the controlling device**

The Roku 317 Accused Players exit the setup procedure for “Set up Remote for TV control” when the “home” button is pressed on the Roku remote. *See* Tr. (Rosenberg) at 160:16-25; CX-0058. This meets the limitations of claim 6.

- 5. Claim 9: The controlled device as recited in claim 1, wherein the instructional information being displayed by the display device comprises a series of displayed navigable menus**

The Roku 317 Accused Players display a series of navigable menus, such as “Please point your remote at the TV” and “Is music playing? Yes or No?”, on the attached TV as part of the TV control configuration, which the user navigates using the arrow keys and OK button. Tr. (Rosenberg) at 161:1-12. This meets the limitations of Claim 9.

- 6. Claim 11: The controlled device as recited in claim 1, wherein the controlled device comprises a transceiver coupled to the processing device for receiving the executable instructions from a remote server for storage in the memory**

Roku does not dispute that its Roku 317 Accused Players include a Wi-Fi transceiver (and the Roku Ultra includes an ethernet port and associated circuitry) that receive the Roku OS (including the software associated with the setup procedures for controlling the TV with the Roku remote) for storage in memory. Additionally, Roku does not dispute that when the Roku 317 Accused Players [REDACTED] which includes the code that provides the functionality described in Claim 1, including the IR code sets. Tr. (Rosenberg) at 161:13-162:9; CX-0509C; JX-0068C (Murthi) at 43:8-14, 46:13-48:4. Thus, the Roku 317 Accused Players satisfy the limitations of Claim 11.

Therefore, the Roku 317 Accused Players infringe asserted claims 3, 6, 9, and 11 of the 317 patent.

E. Domestic Industry – Technical Prong

1. Samsung DI Products Are Protected by the 317 and 196 Patents¹

UEI asserts that the Samsung DI Products are “expressly licensed to the 196 and 317 Patents.” CIB at 53. The licensing agreement, effective January 1, 2011, grants to Samsung and its subsidiaries the right to [REDACTED]

[REDACTED] JX-0035C.1. The UEI Products include UEI QuickSet and QuickSet cloud. JX-0035C.13. The licensed products definition was amended to include [REDACTED]

[REDACTED] (JX-0035C.70). Thus, UEI asserts that the “Samsung DI Products are Licensed products under the Licensing Agreement and its amendment because they are TVs with Smart Remote controls.” CIB at 53. UEI further states that it “authorized Samsung to use the 196 and 317 Patents through years of support and assistance in aiding Samsung in the practice of the 196 and 317 Patents.” CIB at 53, *citing* Tr. (Barnett) at 35:4-42:10, 48:23-53:25, 60:15-63:4; JX-0431; CDX-0078C.5-9, 13. UEI states that Samsung has been its customer for 10 years, that UEI has spent [REDACTED] Samsung-specific implementation costs, and that the Samsung DI Products make about [REDACTED] QuickSet Cloud transactions a week. *Id.*

Roku presents a number of arguments against finding that the Samsung DI Products are protected by the 196 and 317 patents. Roku first argues that in the amendment to the Samsung software license, dated July 25, 2012, UEI [REDACTED]
[REDACTED] to UE Singapore Private Ltd.,

¹ The licensing issues regarding the 196 and 317 patents are discussed together by both parties. To the extent that the issues overlap, both are discussed together here as well.

[REDACTED]

a Singapore corporation. RIB at 46. Subsequently, on June 30, 2013, UE Singapore [REDACTED]

[REDACTED]

[REDACTED] *Id.* at 48. Therefore, Roku submits, as of July 2012 the Samsung software license was not with UEI, the owner of the Asserted Patents was not a party to the Samsung software license, and the Samsung DI Products are not “protected by” the 196 and 317 patents. RIB at 46.

But the license agreement states that C.G. Development is acting [REDACTED] [REDACTED] such as UEI (JX-0035C.65). C.G. Development acts as UEI’s licensing agent with certain Asia-based customers and partners, such as Samsung, and has the right to sub-license UEI’s patents based on an intracompany agreement. *See* RX-0019C.54-55. UEI is, in essence, the real party in interest with respect to the Samsung license.

Roku next argues that Samsung did not have an express license to the 196 and 317 patents because the Samsung software license [REDACTED]

[REDACTED]

[REDACTED] RIB at 47. Roku submits that the “Licensed Materials” were defined as [REDACTED]

[REDACTED]

[REDACTED] RIB at 47. Roku further submits that the license “does not include a license to any of UEI’s intellectual property, including its patents, and expressly restricts the license to the limited rights granted in Section 1.0.” of the license agreement. *Id.* Although no individual patents were originally recited as being licensed, Roku’s description of the scope of the license is otherwise too narrow. In fact, UEI granted a license to [REDACTED]

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[REDACTED]

[REDACTED]

[REDACTED] See JX-0035C.1, .15, .70.

Finally, Roku argues that the Samsung software license does not grant an implied license to the 196 and 317 patents because the license “makes clear that [REDACTED]

[REDACTED]

RIB at 47, *citing* JX-0035C.9. As UEI notes, however, section 11.02 of the license states: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] CRB at 32 (emphasis in original), *citing* JX-0035C.9. And the license agreement, as confirmed by UEI, expressly grants Samsung the right to import articles that practice the 196 and 317 patents.

2. Samsung DI Products Practice Claim 1

Most of the elements of claim 1 of the 317 patent are practiced by the Samsung DI Products. As UEI’s expert Dr. Rosenberg explains, the Samsung DI Products are devices controlled by a remote control, and each possesses a receiver for receiving communications from the remote control, a processing device coupled to the receiver, and a memory storing executable instructions. *See* Tr. (Rosenberg) at 180:5-182:2. [REDACTED]

[REDACTED] as shown in CX-0647C.5. *See id.* at 181:2-182:2; CIB at 11-12. Respondent does not dispute that the Samsung RU8000 is representative of the Samsung DI Products. *See* RIB at 83-84.

The elements covering “executable instructions” involve QuickSet, a UEI software product integrated into the Samsung DI Products. *See* Tr. (Barnett) 35 at 13-17. Dr. Rosenberg explained how QuickSet works:

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[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Tr. (Rosenberg) at 183:13-184:13. So claim elements 1(e), 1(f), and 1(g) are satisfied.

The primary dispute between the parties is whether the Samsung DI Products meet the limitation of claim 1(b), which recites, “a transmitter for transmitting communications to a display device coupled to the controlled device.” RIB at 84. Roku argues that “the claim is drafted to cover a transmitter for transmitting communications to an external display device coupled to a controlled device (in this case, the Samsung TV).” *Id.* However, Roku argues, [REDACTED]

[REDACTED] and therefore the LCD display panel is not coupled to the TV but is an integral part of the TV itself. *Id.* Roku asserts that the Federal Circuit held that a “part of something is not ‘coupled’ to the whole” in *Cutsforth, Inc. v. Motivepower, Inc.*, 643 F.App’x 1008, 1012 (Fed Cir. Apr. 6, 2016) (nonprecedential) ([i]t goes beyond the plain meaning of ‘couple ‘ to say that a sub-component (e.g., an engine in a car) is ‘coupled to’ the component as a whole (e.g., the car)). Roku also cites another Federal Circuit case as support for the argument that the display device must be separate from the Samsung TV. *See Stragent LLC v. BMW North America LLC*, No. 6:11 cv 278, 2013 WL 3367295, *7-*8 (E.D. Tex. July 3, 2013) (construing term “assembly” in limitation reciting “an assembly coupled to the

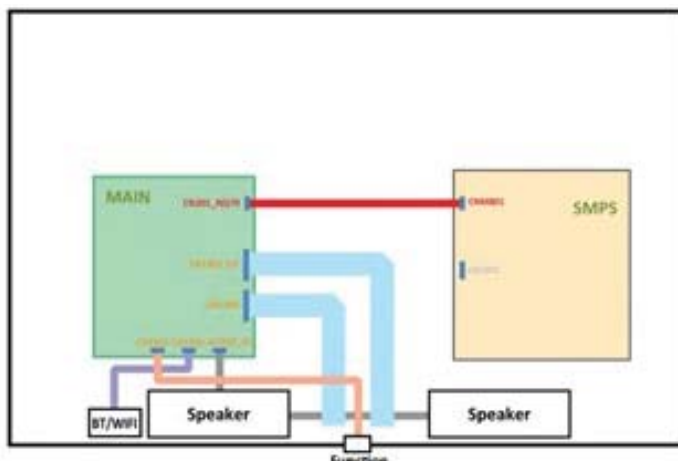
automobile . . . and further connected to a media player adapted for playing music” as requiring that the assembly be separate from the automobile).

The parties’ dispute is fundamentally over what apparatus is identified as the “controlled device.” UEI has identified a particular TV, the Samsung RU8000, as opposed to a component of the Samsung RU8000, as representative of the Samsung DI Products. *See* CIB at 11-12. And in his demonstrative presentation Dr. Rosenberg implied that the controlled device is a TV. *See* Tr. (Rosenberg) at 183:9-12; *see* CDX-0002C.45. But the evidence shows that

In fact,

CRB at 53;

Tr. (Rosenberg) at 181:2-24, 182:3-14; Tr. (Balakrishnan) at 774:9-16. Exhibit CX-00647C.1 (shown below) illustrates this with a side-by-side schematic and photo of the Samsung DI TV with the back cover removed.



CX-0647C.1. So inasmuch as claim 1 is construed as requiring the “controlled device” to be physically distinct from, but coupled to, the “display device,” there would seem to be no barrier to

identifying the controlled device as the main board and the display device as the LCD screen, with both devices housed within the same overall “TV.”

Moreover, although the parties do not frame their dispute as a matter of claim construction, the specification is clear that claim 1 encompasses a single housing for both the claimed invention (the controlled device) and the display device. *See* JX-0004 (317 patent) at 8:39-44 (“while the exemplary embodiment above is presented in terms of interactions between a set top box and a universal remote control, it will be appreciated that many other appliance types, e.g., TV’s, PVRs, DVDs, PCs, etc. may be substituted for the STB without altering the spirit of the invention”). Furthermore, Dr. Rosenberg agreed that “you can put the controlled device inside a TV,” and Dr. Balakrishnan agreed that the 317 patent teaches that the claimed invention can be implemented in a TV. Tr. (Rosenberg) at 183:9-12; Tr. (Balakrishnan) at 777:7-12. So whether the controlled device is the TV overall or just the main board inside the TV, element 1(b) is present in the Samsung DI Products, and the cases on which Roku relies are beside the point.

Therefore, the Samsung DI Products practice claim 1 of the 317 patent.

3. The Samsung DI Products Practice the Asserted Claims

The only argument Roku presents regarding the asserted claims is that the Samsung DI Products do not practice them because they do not practice independent claim 1. RIB at 85. The Samsung DI Products do practice claim 1, however, and the evidence shows that they also practice claims 3, 6, 9, and 11. UEI’s discussion of this evidence is adopted:

Claim 3: The controlled device as recited in claim 1, wherein the at least one command code set comprises an infrared command code set

“The Samsung DI Products configure the Samsung smart remote to control devices connected to the Samsung TV with an infrared command codeset.” CIB at 110, *citing* Tr. (Rosenberg) at 185:1-4; CX-0533C.

Claim 6: The controlled device as recited in claim 1, wherein the instructions cause the controlled device to exit the plurality of setup procedure steps in response to a predetermined communication being received via use of the receiver from the controlling device

“The universal remote setup feature (the instructions) of the Samsung DI Products (the controlled device) will exit the setup procedure of the Universal Remote setup when the user presses the home button (the predetermined communication) on the Samsung remote and that command is received by the Samsung TV.” *Id.*, citing Tr. (Rosenberg) at 185:5-16.

Claim 9: The controlled device as recited in claim 1, wherein the instructional information being displayed by the display device comprises a series of displayed navigable menus

“The Samsung DI Products display a series of navigable menus that display instructional information to the user as part of the Universal Remote setup feature.” *Id.*, citing (Tr. (Rosenberg) at 185:17-25).

Claim 11: The controlled device as recited in claim 1, wherein the controlled device comprises a transceiver coupled to the processing device for receiving the executable instructions from a remote server for storage in the memory



Id. at 100-111, citing CX-0642.108.

Accordingly, the Samsung DI Products practice the asserted claims of the 317 patent.

F. Validity

Roku identifies the following invalidity theories for the 317 patent:

Claims	Theory
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1, 3, 6, 9	Anticipated under 35 U.S.C. § 102(e) by U.S. Patent No. 9,792,133 to Lee (JX-0374)
1, 3, 6, 9, 11	Anticipated under 35 U.S.C. § 102(a) and (b) by TiVo Series 2 DVRs, including SVR-3000 Installation Guide (RX-0223) (“SVR-3000”)
1, 3, 6, 9	Obvious under 35 U.S.C. § 103 by Lee in combination with U.S. Patent No. 6,650,248 to O’Donnell (RX-0225)
1, 3, 6, 9, 11	Obvious under 35 U.S.C. § 103 by various combinations of Lee with SVR-3000 or U.S. Patent No. 7,673,297 to Arsenault (RX-0219) and optionally O’Donnell
1, 3, 6, 9, 11	Unpatentable subject matter under 35 U.S.C. §101

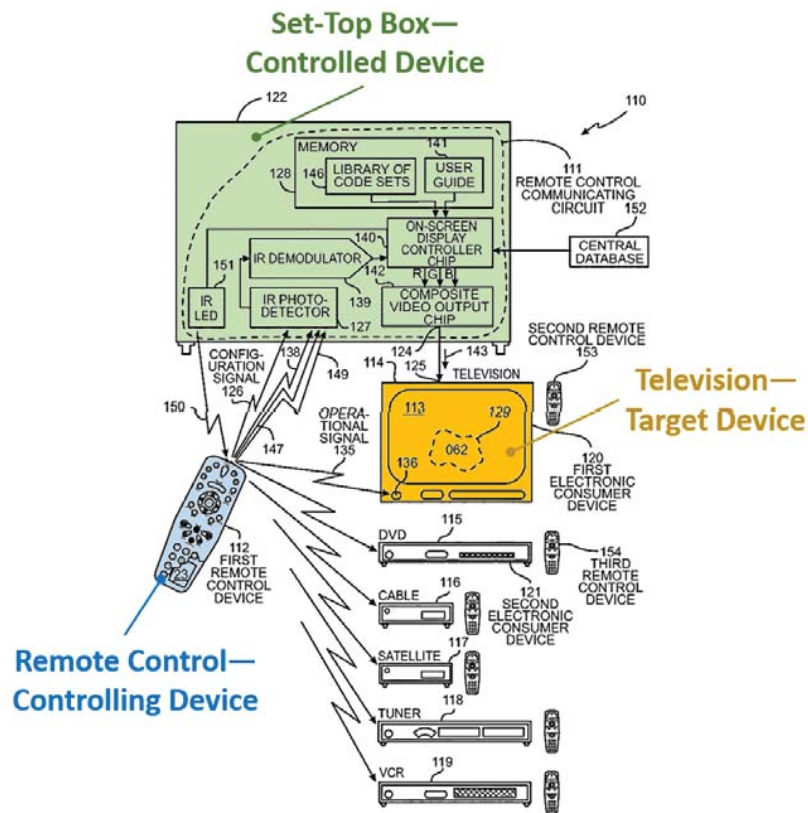
See generally RIB at 85-123; RRB at 50-63.

U.S. Patent No. 9,792,133 (“Lee”) issued on October 17, 2017, has a priority date of February 10, 2004, and is prior art to the 317 patent under pre-AIA 35 U.S.C. § 102(e) because the 317 patent’s earliest priority date is 2005. RIB at 85; JX-0374; JX-0004. The TiVo Series 2 DVR, including the Sony/TiVo SVR-3000, were on sale and in public use in the U.S. in 2002, and the SVR-3000 Installation Guide was publicly available as of 2002. RX-0220C.0001; RX-0223; Tr. (Schmidt) at 642:22-643:3 (TiVo began sales of Series 2 DVRs in 2002). Thus, the SVR-3000 product and its documentation are prior art to the 317 patent under pre-AIA 35 U.S.C. §§ 102(a) and (b). O’Donnell issued on November 13, 2003 and is prior art to the 317 patent under pre-AIA 35 U.S.C. §§ 102(a) and (b). RX-0225. Arsenault issued on March 2, 2010, with a priority date of September 3, 2003, and is prior art to the 317 patent under pre-AIA 35 U.S.C. § 102(e). RX-0219.

1. Anticipation Under 35 U.S.C. § 102

a. Lee

Roku contends claims 1, 3, 6, and 9 are anticipated by Lee, which “describes a system for setting up a universal remote control to control multiple electronic consumer devices, which ‘enables users to program their electronic consumer devices in a step-by-step interactive manner.’” RIB at 86, *citing* JX-0374 (Lee) at 15:31-43. Roku further states that Lee discloses several similar embodiments setting up a universal remote control, “the second of which (disclosed starting at 17:28) is nearly identical to the preferred embodiment of the ‘317 patent.” *Id.*, *citing* JX-0374 (Lee) at 17:28-19:50; Tr. (Balakrishnan) 695:3-696:17. To illustrate this, Roku annotates Fig. 14:



JX-0374 (Lee) at Fig. 14.

According to Roku, Lee teaches:

[P]rogramming the universal remote to control an electronic device begins by pressing a “set-up” key on the remote, which causes the system to enter into a “configuration mode.” JX-0374 (Lee) at 17:36-39; 19:28-29. Once the

“configuration mode” is initiated, display 113 displays instructions to guide the user through the set-up process. As shown in Fig. 16 below, “the user is first prompted to select the device type,” from among the options: “TV, VCR, DVD, AMP, SAT, and CABLE.” *Id.* at 18:5-9. The user then uses the arrow keys on the remote to highlight his choice, and then presses the “select” key to select the appropriate device type, in this case, “TV.” *Id.* at 18:11-14; *see also* Tr. (Balakrishnan) 695:3-14; *see also* RDX-0004C.32.

After the user chooses the type of device, the text shown in Fig. 17 (below) is shown, which “prompts the consumer to select the brand” of the TV. JX-0374 (Lee) at 18:16-29; *see also* Tr. (Balakrishnan) 695:15-24; *see also* RDX-0004C.33.

After the user chooses a brand of television, text is shown that “prompts the consumer to select a model” of the brand chosen, in this case, of a Sylvania TV. *See* JX-0374 (Lee) at 18:32-36; *see also* RDX-0004C.34. The circuit 111 then “displays a designation of a first code set on display 133, for example, the number ‘062,’” as shown in Fig. 14 above, which the user enters into the remote control. *See* JX-0374 (Lee) at 18:36-43; *see also* RDX-0004C.35. This activates a code set in the remote control, which allows the user to operate the TV’s various controls, such as volume and channel controls. *Id.* at 18:44-48; *see also* Tr. (Balakrishnan) 695:22-696:11.

RIB at 86-87.

The teachings of Lee with respect to the claims follows, using the same claim limitations and designations previously used.

(i) Claim 1

(a) Limitation 1(preamble) – “a controlled device”

As shown in Fig. 14 of Lee, set top box 122 contains a remote control communicating circuit 111. JX-0374 (Lee) at 15:58-62. UEI does not dispute that Lee discloses limitation 1(preamble). *See generally* CIB at 111.

(b) Limitation 1(a) - “a receiver for receiving communications from a remotely located controlling device”

Lee discloses “a receiver for receiving communications” (IR photodetector 127 in Fig. 14) “from a remotely located controlling device” (remote control 112 in Fig. 14). JX-0374 (Lee) at,

17:39-42 and 20:17-23 and Figs. 16-18; Tr. (Balakrishnan) 697:11-22; RDX-0004C.37. UEI does not dispute that Lee discloses limitation 1(a). *See generally* CIB at 111.

(c) Limitation 1(b) – “a transmitter for transmitting communications to a display device coupled to the controlled device”

Lee discloses “a transmitter” (composite video output chip 142 in Fig. 14) “for transmitting communications to a display device” (display/TV 113) “coupled to the controlled device” (set-top box 122). JX-0374 (Lee) at 17:31-36, 17:66-18:4, and Fig. 14; Tr. (Balakrishnan) 697:23-698:14; RDX-0004C.38. UEI does not dispute that Lee discloses limitation 1(b). *See generally* CIB at 111.

(d) Limitation 1(c) – “a processing device coupled to the receiver and the transmitter”

Lee discloses “a processing device” (on-screen display controller chip 140 in Fig. 14) which is “coupled to the receiver” (IR photodetector 127) “and the transmitter” (composite video output chip 142). JX-0374 (Lee) at 17:44-56, 17:62-18:4, and Fig. 14; Tr. (Balakrishnan) 698:15-699:4; RDX-0004C.39. UEI does not dispute that Lee discloses limitation 1(c). *See generally* CIB at 111.

(e) Limitation 1(d) – “a memory storing executable instructions, wherein the instructions, when executed by the processing device, cause the controlled device to”

Lee discloses “a memory storing executable instructions” (memory 128 in Fig. 14), “wherein the instructions, when executed by the processing device” (on-screen display controller chip 140 in Fig. 14) “cause the controlled device” (set-top box 122) to perform certain operations. JX-0374 (Lee) at 16:25- 31, 17:57-18:4, and Fig. 14; Tr. (Balakrishnan) 699:5-22; RDX-0004C.40. UEI does not dispute that Lee discloses limitation 1(d). *See generally* CIB at 111.

(f) Limitation 1(e) – “automatically progress through a plurality of setup procedure steps in response to each of

a plurality of communications received via use of the receiver from the controlling device”

Lee discloses “automatically progress[ing] through a plurality of setup procedure steps” (the procedure steps shown in Figs. 16-19) “in response to each of a plurality of communications received via use of the receiver” (IR photodetector 127 in Fig. 14) “from the controlling device” (the remote control 112, which transmits a signal to the set-top box 122 when the user presses a “select” key on the remote control, which automatically activates the next setup procedure step). JX-0374 (Lee) at Figs. 16-19, 17:36-39, 18:5-14, 18:16-30, 18:33-36, 18:63-19:50, and 19:51-20:16; Tr. (Balakrishnan) 699:23-700:16; RDX-0004C.41.

UEI disputes that Lee discloses limitation 1(e). UEI argues that “merely selecting a device type and brand does not teach or suggest the automatic progression through a plurality of setup procedure steps.” CIB at 112. UEI relies on its proposed claim construction, which has two requirements: “element 1(e) requires a plurality of setup procedure steps; and while a user prompt (for example an inquiry of the type and brand of device to be controlled) is *part* of a procedure step, a prompt *alone* is not a procedure step and/or two user prompts is not a plurality of setup procedure steps.” CIB at 82. As discussed above, however, UEI’s proposed construction is not adopted, and an individual procedure step can consist of a selection of an individual type or brand. And that is what Lee teaches. *See* JX-0374 at 18:5-43 and Figs. 16-18 (showing selection of device type, brand, and model in response to prompts).

(g) Limitation 1(f) – “transmit to the display device via use of the transmitter communications to cause the display device to display instructional information to a user while progressing through the plurality of setup procedure steps”

Lee discloses “transmit[ting]” (via composite video output signal 143) “to the display device” (display 113) “via the use of the transmitter” (composite video output chip 142) “to display

instructional information to a user while progressing through the plurality of setup procedure steps” (instructional information and steps shown in Figs. 16-19). JX-0374 (Lee) at Figs. 16-19, 17:36-39, 18:5-14, 18:16-30, 18:33-36, 18:63-19:50, and 19:51-20:16; Tr. (Balakrishnan) 701:24-703:3; RDX-0004C.43-44.

As with limitation 1(e), UEI disputes that Lee discloses limitation 1(f), based on its proposed claim construction. CIB at 112. As noted, that claim construction was not adopted, because prompts to the user qualify as “instructional information.” Lee plainly discloses this element. *See* JX-0374 at 18:5-43 and Figs. 16-18 (showing prompts for selection of device type, brand, and model transmitted to the display device).

- (h) **Limitation 1(g) – “in response to at least a type and brand of a target device to be controlled via use of the controlling device being identified via use of the plurality of setup procedure steps, select at least one command code set which has been predetermined to be likely to be usable by the controlling device to control the operational functions of the target device when subsequently provisioned to the controlling device”**

Lee discloses “select[ing] at least one command code set” (the controlled device selecting a designation of a first code set such as “062” after the user chooses type, brand, and model using the remote control) “which has been predetermined to be likely to be usable to control . . . the operational functions of the target device when subsequently provisioned to the controlling device” (the first code set is predetermined to be likely to control the target device TV 114 because it was predetermined based on the user’s selection of the type, brand, and model of the TV to be controlled) “in response to a type and brand of target device” (TV 114) “identified via the use of the plurality of setup procedure steps” (the steps identified in Fig. 16-18 where the user identifies type, brand, and model of the TV). JX-0374 (Lee) at Figs. 16-19, 17:36-39, 18:5-14, 18:16- 30, 18:33-36, 18:36-43, 18:44-46, 18:63-19:50, and 19:51-20:16; Tr. (Balakrishnan) 704:4-705:5;

RDX-0004C.46-48. The command code is “subsequently provisioned to the controlling device” when a code set on the remote is activated (*see* JX-0374 (Lee) at 18:44-46), or when the code set is sent from the controlled device (STB 122) to the remote (*see* JX-0374 (Lee) at 20:17-21:11, Fig. 20; *see also* Tr. (Balakrishnan) 705:6-706:23).

UEI disputes that Lee teaches element 1(g) based on its proposed claim construction. CIB at 113. Specifically, UEI argues that only testing can predetermine whether a code set is likely to be usable, and identifying type, brand, and model “is not sufficient.” *Id.* As noted above, this construction was not adopted. And Lee recites the use of at least device type and brand for selecting a code set, where the displayed code set “corresponds to the . . . electronic consumer device that the consumer has selected.” JX-0374 (Lee) at 19:21-22.

Thus, Lee discloses all limitations of claim 1 of the 317 patent, and claim 1 is anticipated.

(ii) **Claim 3 – “The controlled device as recited in claim 1, wherein the at least one command code set comprises an infrared command code set”**

Lee discloses that the signal for controlling the target device is transmitted at infrared frequencies: “An IR photodetector 136 on television 114 receives operational signal 135 . . . to operate television 114.” JX-0374 (Lee) at 17:2-7; Tr. (Balakrishnan) 709:9-20; RDX-0004C.50. UEI does not dispute that Lee discloses the additional limitation of claim 3. *See* CIB at 113 (UEI states that since Lee “does not teach all of the limitations of Claim 1, it similarly does not anticipate any of Claims 3, 6, 9, or 11”).

(iii) **Claim 6 – “The controlled device as recited in claim 1, wherein the instructions cause the controlled device to exit the plurality of setup procedure steps in response to a predetermined communication being received via use of the receiver from the controlling device”**

Lee discloses a “predetermined communication” (a second press of the “setup” key) that causes “the controlled device” (*e.g.*, set-top box 122) “to exit the plurality of setup procedure steps”

(leave the configuration mode and return to the operational mode). JX-0374 (Lee) at 18:44-51 and 19:28-29; Tr. (Balakrishnan) at 709:21-710:10; RDX-0004C.51.

(iv) **Claim 9 – “The controlled device as recited in claim 1, wherein the instructional information being displayed by the display device comprises a series of displayed navigable menus”**

Lee discloses “instructional information being displayed” (“highlight device type,” and lists of device types, brands, and models, as shown in Figs. 16-18) that “comprises a series of navigable menus” (the user navigates through the menus shown in Figs. 16-18 using arrow keys 44 in Fig. 15). JX-0374 (Lee) at Figs. 16-19, 18:5-14, 18:16-30, and 18:33-36; Tr. (Balakrishnan) at 711:22-712:7; RDX-0004C.53.

b. TiVo Series 2 DVRs, including SVR-3000

As a preliminary matter, UEI argues that Roku relies on multiple items of prior art as a single anticipatory reference, which is inappropriate. CIB at 114. Specifically, UEI asserts that Roku relies on both the SVR-2000 and SVR-3000 as a single reference. *See id.* Roku clarifies that its anticipation case is based on the sale of the SVR-3000 (and, presumably, its public use) more than a year before the 317 patent’s priority date as the anticipatory reference, and “the publications, along with the testimony of a witness with first-hand knowledge (former TiVo employee Margret Schmidt),” to describe the SVR-3000 product. RRB at 53. This is appropriate. *See Sonoscan, Inc. v. Sonoter, Inc.*, 936 F.2d 1261, 1263 (Fed. Cir. 1991) (multiple references can be used to prove an on-sale bar); *IP Innovation L.L.C. v. Red Hat, Inc.*, No. 2:07-cv-447, 2010 WL 9501469 at *4 (E.D. Tex. Oct. 13, 2010) (“This court sees no error in using multiple references to describe a single prior art system for the purpose of showing anticipation”). And if proven to anticipate the asserted claims of the 317 patent, the SVR-3000 would render them invalid under pre-AIA 35 U.S.C. § 102(a) because it was “known or used by others in this country” before the 317 patent’s priority date, and under pre-AIA 35 U.S.C. § 102(b) because it was on sale and in

public use more than one year before the 317 patent's priority date. *See* Tr. (Schmidt) at 642:20-24 (the SVR-3000 was a Sony/TiVo product).

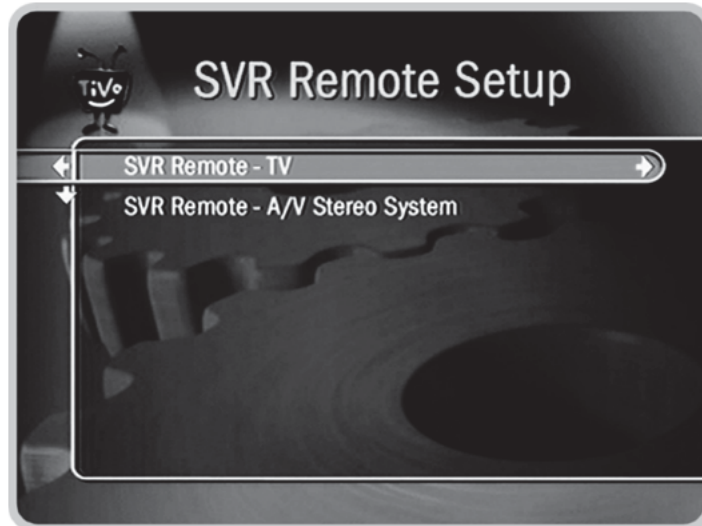
Also, although the SVR-2000 reference, which is almost identical to the SVR-3000 reference, was listed in an Information Disclosure Statement during prosecution, there is no evidence it was explicitly considered. *See* CX-0152 at UEI-ITC_0488589. So the weight of the SVR-3000 as a prior art reference is unaffected. *See Sciele Pharma Inc. v. Lupin Ltd.*, 684 F.3d 1253, 1260 (Fed. Cir. 2012) ("it could be reasonable to give more weight to new arguments or references that were not explicitly considered by the PTO").

Roku describes the steps to set up an SVR-3000:

Once the user sees the "Welcome to TiVo!" screen, the user can set up and activate the TiVo Service. *See* RX-0223 (Sony SVR-3000 Installation Guide) at 34; *see also* Tr. (Balakrishnan) 715:18-25.

Next, the user can set up the remote control to control the power, muting, and volume of a target device (*e.g.*, a TV) by using the "Remote Control Setup" option on the Messages & Setup screen. *See* RX-0223 (Sony SVR-3000 Installation Guide) at 41; Tr. (Balakrishnan) 715:23-716:3; RDX-0004C.57. The user can also use the same screen to set up the remote control to control a connected A/V stereo system. The process for setting up the remote control uses interactive instructions through a series of displayed navigable menus/prompts. For example, after the user chooses "Messages & Setup," the user then selects "SVR Remote Setup." RX-0223 (SVR-3000 Installation Guide) at 41. Then, the user can choose either "SVR Remote – TV" or "SVR Remote – A/V Stereo System" to setup the remote to control either type of device. *See* RX-0223 at 41; Tr. (Balakrishnan) 715:23-716:4; RDX-0004C.57.

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RX-0223 (Sony SVR-3000 Installation Guide) at 41; *see also* RDX-0004C.57.

Assuming the user chooses to set up the remote to control the TV, next, the user can use the CH (Channel) +/- buttons to scroll down the list of TV brands page by page, or use the arrow buttons to scroll down line by line, to choose the TV brand from the list, and press SELECT. *See* RX-0223 at 41; Tr. (Balakrishnan) 716:4-13; RDX-0004C.58.



When the user selects the TV brand, he/she will see a screen with one or more four-digit codes for controlling the TV. *See* RX-0223 at 42; Tr. (Balakrishnan) 716:14-19; RDX-0004C.59.



RX-0223 (Sony SVR-3000 Installation Guide) at 42; see also RDX-0004C.59.

The user is instructed by the on-screen instructions to press the power and TiVo buttons on the remote for five seconds. The user is then instructed to use the number keys on the remote control to enter the four-digit code the user wants to test. *See* RX-0223 at 42; *see also* Tr. (Balakrishnan) 716:20-717:1; Tr. (Schmidt) 649:3-15; RDX-0004C.59. The user is then instructed to test the code by pointing the remote control in the direction of the TV and pressing the TV POWER button. If this turns the TV off, the user has found the correct code. Now the user can use the remote control to turn the TV on and off, control volume, and mute the sound. *Id.* If the TV does not turn off, then the user is instructed to “try the next code.” *See* RX-0223 at 42; Tr. (Balakrishnan) 716:20-717:1; Tr. (Schmidt) 649:16-650:6; RDX-0004C.59.

Additionally, the user can receive software updates and upgrades for the TiVo service regularly and automatically. *See* RX-0595 (TiVo Viewer’s Guide) at iv, 75, 103, and 105; *see also* Tr. (Schmidt) 652:1-653:24.

RIB at 93-95.

The teachings of SVR-3000 with respect to the claims follow, using the same claim limitations and designations previously used.

(i) Claim 1

(a) Limitation 1(preamble) – “A Controlled Device”

The SVR-3000 is “a controlled device.” *See* RX-0223 (Sony SVR-3000 Installation Guide) at 8; Tr. (Balakrishnan) at 717:6-15; RDX-0004C.60.

(b) Limitation 1(a) – “a receiver for receiving communications from a remotely located controlling device”

The SVR-3000 “[r]eceives control signals from your Remote Control,” via a “remote control signal reception window.” RX-0223 (Sony SVR-3000 Installation Guide) at 9; Tr. (Balakrishnan) at 717:16-718:5; RDX-0004C.61.

(c) Limitation 1(b) – “a transmitter for transmitting communications to a display device coupled to the controlled device”

The SVR-3000 has “a transmitter” (which includes audio-video output jacks and video driver) “for transmitting communications to a display device” (a television) “coupled to the controlled device” (SVR-3000). RX-0223 (Sony SVR-3000 Installation Guide) at 10; RX-0222C (SVR-3000 Service Manual) at 11; Tr. (Balakrishnan) at 718:6-719:8; RDX-0004C.62-63.

(d) Limitation 1(c) – “a processing device coupled to the receiver and the transmitter”

The SVR-3000 has “a processing device” (MIPS CPU) “coupled to the receiver” (Remote Control Signal Reception Window) “and the transmitter” (including audio-video output jacks and video driver). RX-0222C (Sony SVR-3000 Service Manual) at 11, 18; RDX-0004C.65; *see also* Tr. (Balakrishnan) at 719:9-720:5 (this limitation is inherent in RX-0223 (Sony SVR-3000 Installation Guide)).

(e) Limitation 1(d) – “a memory storing executable instructions, wherein the instructions, when executed by the processing device, cause the controlled device to”

The SVR-3000 has multiple memories, including the system memory, that store executable instructions. *See* RX 0222C (Sony SVR-3000 Service Manual) at 11, 20; RDX-0004C.66; *see also* Tr. (Balakrishnan) at 720:6-721:2 (this limitation is inherent in RX-0223 (Sony SVR-3000 Installation Guide)).

(f) **Limitation 1(e) – “automatically progress through a plurality of setup procedure steps in response to each of a plurality of communications received via use of the receiver from the controlling device”**

The SVR-3000 “automatically progress[es] through a plurality of setup procedure steps” (the “SVR Remote Setup,” “Television Brand, and “Codes for [Brand]” setup steps) “in response to each of a plurality of communications received . . . from the controlling device” (the remote transmits a signal to the SVR-3000 when the user makes a selection, which automatically causes the device to go to the next step) “via use of the receiver” (remote control signal reception window). RX-0223 (Sony SVR-3000 Installation Guide) at 9, 41-42; Tr. (Balakrishnan) at 717:22, 721:3-16; RDX-0004C.67-69.

UEI does not expressly dispute the presence of limitations 1(preamble) through 1(d) in the SVR-3000, but does dispute the presence of limitation 1(e). *See* CIB at 114. UEI first argues that prompts to the user do not qualify as “setup procedure steps,” an argument that, as explained, is inconsistent with the proper claim construction. *See id.* at 114-15. UEI also argues that once the type and brand of device is identified, and a list of codes is displayed, the display screen is static and therefore does not “automatically progress.” *See id.* at 115. This is beside the point, though, because the SVR-3000 “automatically progress[es] through a plurality of setup procedure steps” earlier in the setup process. *See* RX-0223 (Sony SVR-3000 Installation Guide) at 41 (describing the user prompts displayed at each step). Therefore, the SVR-3000 discloses limitation 1(e).

(g) **Limitation 1(f) – “transmit to the display device via use of the transmitter communications to cause the display device to display instructional information to a user while progressing through the plurality of setup procedure steps”**

SVR-3000 “transmits to the display device . . . communications” (from the SVR-3000 to the TV display) “via use of the transmitter” (audio-video output jacks and video driver) “to cause

the display device to display instructional information to a user” (the “SVR Remote Setup,” “Television Brand,” and “Codes for [Brand]” screens) “while progressing through the plurality of setup procedure steps” (each instructional information screen displayed corresponds to a setup procedure step). RX-0223 (Sony SVR-3000 Installation Guide) at 41; Tr. (Balakrishnan) at 718:12-25, 723:7-19; RDX-0004C.70.

UEI disputes the presence of limitation 1(f) in the SVR-3000 because the prompts the SVR-3000 causes to be displayed do not qualify as “instructional information.” CIB at 115. Again, this argument is inconsistent with the proper construction of that claim element. Therefore, the SVR-3000 limitation 1(e).

- (h) **Limitation 1(g) – “in response to at least a type and brand of a target device to be controlled via use of the controlling device being identified via use of the plurality of setup procedure steps, select at least one command code set which has been predetermined to be likely to be usable by the controlling device to control operational functions of the target device when subsequently provisioned to the controlling device”**

The SVR-3000 “select[s] at least one command code set” (a user identifying a type and brand causes the SVR-3000 to select and then display one or more four-digit codes on the “Codes for [Brand]” screen) “which has been predetermined to be likely to be usable by the controlling device to control operational functions of the target device” (the setup steps identify the type and brand of the TV to find one or more codes that are likely to work to operate the TV) “in response to at least a type and brand of a target device to be controlled via use of the controlling device being identified via the setup procedure steps” (the “SVR Remote Setup,” “Television Brand, and “Codes for [Brand]” setup steps) “when subsequently provisioned to the controlling device” (by activating the selected command code set in the remote). RX-0223 (Sony SVR-3000 Installation Guide) at 41-42; Tr. (Balakrishnan) at 724:17-726:1; RDX-0004C.72-75.

UEI disputes that this limitation is taught. First, it argues that the SVR-3000 does not select a command code that is predetermined to be likely to “work on the target device.” CIB at 116. UEI bases this argument on an incorrect claim construction, though, as discussed above. Second, it argues that the SVR-3000 discloses “fully provisioning the code set before” the displayed codes are tested, that is, the SVR-3000’s operation is “backward” because “you must first provision and thereafter test each code manually.” *Id.* (emphasis omitted). This argument, too, is inconsistent with the proper claim construction, which is that “predetermined” means, in essence, selected before any testing by the user. And UEI does not dispute that the SVR-3000 selects codes from the universe of all possible codes based on the type and brand of target device, and before any such codes are either input to the remote control or tested. *See* CIB at 116, 121.

Thus, the SVR-3000 possesses all limitations of claim 1 of the 317 patent, and claim 1 is anticipated.

(ii) **Claim 3 – “The controlled device as recited in claim 1, wherein the at least one command code set comprises an infrared command code set”**

The SVR-3000 discloses “at least one command code set” that “comprises an infrared command code set.” The remote control is set up to control the target device (*e.g.*, a television) via infrared commands. Tr. (Schmidt) at 651:19-25. The SVR-3000 Installation Guide refers to the “IR Emitter” on the remote that can control the TV, which shows that the remote uses IR command codes. RX-0223 (Sony SVR-3000 Installation Guide) at 42-43; Tr. (Balakrishnan) at 728:2-11; RDX-0004C.76. UEI does not expressly dispute that the SVR-3000 discloses the additional limitations in dependent claims 3, 6, 9, or 11. CIB at 116.

(iii) **Claim 6 – “The controlled device as recited in claim 1, wherein the instructions cause the controlled device to exit the plurality of setup procedure steps in response to a predetermined communication being received via use of the receiver from the controlling device”**

The SVR-3000 discloses that, “[t]he controlled device . . . exit[s] the plurality of setup procedure steps in response to a predetermined communication . . . from the controlling device” (pressing the TiVo button on the remote control causes the SVR-3000 to go back to the main menu). RX-0223 at 11-12; Tr. (Schmidt) at 650:1-11; Tr. (Balakrishnan) at 728:12-729:2; RDX-0004C.77.

(iv) **Claim 9 – “The controlled device as recited in claim 1, wherein the instructional information being displayed by the display device comprises a series of displayed navigable menus”**

The SVR-3000 causes the “display device” (TV) to display “instructional information” (display screens asking the user to select the type and brand of device and then displaying codes corresponding to the type and brand) that “comprises a series of displayed navigable menus” (the user navigates through a list of types and brands by scrolling via the remote control). RX 0223 (Sony SVR-3000 Installation Guide) at 41-42; Tr. (Balakrishnan) at 729:3-18; RDX-0004C.78.

(v) **Claim 11 – “The controlled device as recited in claim 1, wherein the controlled device comprises a transceiver coupled to the processing device for receiving the executable instructions from a remote server for storage in the memory”**

The SVR-3000 has “a transceiver coupled to the processing device” (modem and/or transceiver coupled to MIPS CPU). *See* RX-0222C (Sony SVR-3000 Service Manual) at 11 and accompanying text. The transceiver “receiv[es] the executable instructions from a remote server” (SVR-3000 provides automatic software updates (“executable instructions”) from a remote server) “for storage in the memory” (SVR-3000 has multiple memories, including the system memory, as disclosed in its Service Manual, that store executable instructions). *See* RX-0595 (TiVo Viewer’s Guide) at vi, 75, 103, and 105; RX-0222C (SVR-3000 Service Manual) at 11, 20; Tr. (Schmidt) at 652:1-654:2; Tr. (Balakrishnan) at 729:19-731:11; RDX-0004C.79-80.

Accordingly, Roku has shown anticipation of asserted claims 3, 6, and 9 by Lee by clear and convincing evidence, and has shown anticipation of asserted claims 3, 6, 9, and 11 by the SVR-3000 by clear and convincing evidence.

2. Obviousness Under 25 U.S.C. § 103

Roku contends that various combinations of references render various claims invalid as obvious, but some of Roku's arguments presuppose that its asserted claim construction is not adopted. *See generally* CIB at 100-09. Because that proposed claim construction was adopted, and UEI's was not, many of Roku's arguments are not well-taken, and it has accordingly not carried its burden. Nonetheless, anticipation is the "epitome of obviousness," so all the asserted claims of the 317 patent are necessarily obvious in view of Lee and the SVR-3000. *In re Kalm*, 378 F.2d 959, 962 (C.C.P.A. 1967).

In light of these observations, the obviousness analysis is fairly straightforward. Lee renders obvious (because of anticipation) claims 3, 6, and 9, so Roku has demonstrated the obviousness of these claims in light of Lee in combination with any other reference. Similarly, the SVR-3000 renders obvious (because of anticipation) claims 3, 6, 9, and 11, so Roku has demonstrated the obviousness of these claims in light of the SVR-3000 in combination with any other reference. Roku's asserted combinations of (1) Lee and the SVR-3000 or Arsenault and optionally in light of O'Donnell, and (2) Lee and O'Donnell are predicated on the rejected claim construction that "setup procedure steps" requires testing. *See* RIB at 100, 105. So Roku has not demonstrated the obviousness of any claim based on those two combinations of references.

The only combination of references remaining is Lee and Arsenault as it applies to claim 11. *See* RIB at 104-05. Arsenault teaches a method and apparatus for updating set-top box software from a resident software version stored in a memory of the set-top box to the most current software via a satellite link. RX-0219 (Arsenault) at 2:12-14. Specifically, in Fig. 5, Arsenault

discloses a “transceiver” (tuner/demodulator 504) “coupled to the processing device” (microcontroller 510) and “memory” (RAM memory 550 and flash memory 552) and in the associated textual description. RX-0219 (Arsenault) at Fig. 5 and 9:26-12:36; Tr. (Balakrishnan) at 743:5-744:17; RDX-0004C.90, .92. Arsenault further discloses “receiving executable instructions from a remote server”: “The method comprises the step of automatically checking to determine if the resident software version is the current software version, and downloading data comprising at least a portion of the current software version if the resident software version is not the current software version.” RX-0219 (Arsenault) at Abstract, 2:10-27, Fig. 6; Tr. (Balakrishnan) at 743:5-744:17; RDX-0004C.91.

As discussed, Lee teaches all the elements of claim 11 except the “transceiver . . . for receiving the executable instructions.” And Arsenault teaches that element, so the scope and content of the prior art contain all the features of claim 11, and the differences between claim 11 and the prior art are small (because Lee comes close to anticipating that claim). Roku’s expert opined that Arsenault is in the same field of endeavor as the 317 patent, namely, set-top boxes, it is reasonably pertinent to the problems solved by the 317 patent, because it deals with automatic updates of remote controls, and a skilled artisan would have been motivated to combine Arsenault’s transceiver-related teaching with the 317 patent, because “there’s certainly a motivation there to keep things updated.” Tr. (Balakrishnan) at 742:15-743:4, 744:18-745:2.

UEI points to no testimony from its expert, Dr. Rosenberg, regarding Arsenault. *See* CIB at 120; CRB at 58; *see generally* Tr. (Rosenberg) at 1218-1308. UEI instead presents only an argument that Arsenault pertains to a different subject matter, “updating software on a set-top box over a satellite link,” and that a skilled artisan would not be motivated to combine Arsenault’s teaching with Lee. *See* CIB at 120.

I do not agree. Arsenault is related to using and programming set-top boxes. *See* RX-0219 (Arsenault) at Abstract. Moreover, the combination on which Roku relies is Lee and the teaching by Arsenault to update a set-top box's software, and that reference is not limited to just transmission via satellite. *See, e.g.*, RX-0219 (Arsenault) at 1:18-22 (the invention relates to "a system and method for automatically updating software"); *id.* at 1:30-33 ("One product which particularly benefits from the ability to upgrade software are set top boxes (STBs) . . . used in cable or satellite television reception"). And the only evidence pertaining to motivation to combine came from Dr. Balakrishnan, who opined that there was such a motivation. Thus, the knowledge of one skilled in the art weighs in favor of obviousness.

As for secondary indicia of non-obviousness, although there is considerable evidence of such indicia for the QuickSet products, and Dr. Rosenberg opined that such indicia exist relative to the 196 patent, UEI offers no evidence providing a nexus between any secondary indicia and the 317 patent. *See* CIB at 76-78; Tr. (Rosenberg) at 1246:24-1247:2. In particular, Mr. Barnett's description of QuickSet's operation does not closely resemble claim 1 of the 317 patent, because it lacks the "automatically progress" and "transmit to the display device" elements. *See generally* Tr. (Barnett) at 55-59. Overall, the scope and content of the prior art, the knowledge of one skilled in the art, and the differences between the claimed invention and the prior art all weigh in favor of obviousness, and there are no countervailing secondary considerations of non-obviousness. Therefore, claim 11 is obvious in view of Lee in combination with Arsenault.

Accordingly, in view of the Graham factors Roku has shown asserted claims 3, 6, 9, and 11 of the 317 patent to be obvious in light of Lee, the SVR-3000, and the combination of Lee and Arsenault. Roku has otherwise not shown the claims to be obvious.

3. 35 U.S.C. § 101

a. Legal Standard

35 U.S.C. § 101 provides that “[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, . . .” In defining exactly what is patentable subject matter, the Supreme Court has held that abstract ideas form the “basic tools of scientific and technological work” and are therefore unpatentable subject matter under 35 U.S.C. § 101. *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014). The Supreme Court provided a two-part test for assessing patent eligibility under Section 101. First, a court must determine whether the claims are directed to a patent-ineligible concept. *Id.* at 217. If not, the inventions are patent-eligible, and the inquiry ends. *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1339 (Fed. Cir. 2016). If the claims are directed to a patent-ineligible concept, the court must then “consider the elements of each claim both individually and as an ordered combination to determine whether the additional elements transform the nature of the claim into a patent eligible application.” *Alice*, 573 U.S. at 217-218. Claims are patent-eligible under step two if they contain limitations that “involve more than performance of well-understood, routine, and conventional activities previously known to the industry.” *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1367 (Fed. Cir. 2018).

At step one, courts examine the claims to determine whether their “character as a whole,” or their “focus,” is an abstract idea. *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016). Claims focused “on collecting information, analyzing it, and displaying certain results of the collection and analysis, . . . fall into a familiar class of claims ‘directed to’ a patent-ineligible concept.” *Id.* The key inquiry is whether the claims recite “‘a specific means or method that improves the relevant technology’ or are ‘directed to a result or effect that itself is the abstract idea and merely invoke generic processes and machinery.’” *Apple, Inc. v. Ameranth, Inc.*, 842 F.3d 1229, 1241 (Fed. Cir. 2016). Furthermore, “mere automation of manual processes using

generic computers does not constitute a patentable improvement in computer technology.” *Credit Acceptance Corp. v. Westlake Services*, 859 F.3d 1044, 1055 (Fed. Cir. 2017); *FairWarning IP, LLC v. Iatric Sys.*, 839 F.3d 1089, 1095 (Fed. Cir. 2016). By contrast, a claim that recites a specific technique that “improve[s] the functioning of the computer itself” may be patent eligible if appropriately claimed. *Enfish*, 822 F.3d at 1335.

If the claims at issue are directed to a patent-ineligible concept, step two requires that the claim elements be scrutinized “both individually and ‘as an ordered combination’ to determine whether the additional elements ‘transform the nature of the claim’ into a patent-eligible application.” *Enfish*, 822 F.3d at 1354 (*quoting Alice*, 573 U.S. at 217). What is required to establish eligibility, under both steps one and two, is an element of technological innovation that amounts to more than the abstract idea itself. “[I]t is ‘relevant to ask whether the claims are directed to an improvement in computer functionality versus being directed to an abstract idea, even at the first step of the *Alice* analysis.’” *Procter & Gamble Co. v. QuantifiCare Inc.*, 288 F. Supp. 3d 1002, 1022 (N.D. Cal. 2017) (*quoting Enfish*, 822 F.3d at 1335). A patentee may be required to present “an arguably inventive set of components or methods, such as measurement devices or techniques, that would generate new data.” *Electric Power*, 830 F.3d at 1355.

b. Step One

On July 22, 2020, Respondents moved for summary determination that the asserted claims of the 317 patent and related U.S. Patent No. 7,969,514 (which was later withdrawn from the investigation) are invalid for claiming patent ineligible subject matter under 35 U.S.C. § 101. Summary determination was denied, although the claims of the 317 patent were found to recite the abstract idea of automating the set-up of a remote controller to enable it to control a plurality of devices by “using conventional electronic components that substitute for a user’s” having to manually look up setup codes and enter instructions into the remote controller. *See* Order No. 21

at 8 (Sept. 14, 2020), citing *Certain Road Construction Machines and Components Thereof*, 337-TA-1088, Initial Determination at 7 (May 24, 2018), *aff'd*, Comm'n Op. (July 15, 2019) (public version). Specifically, claim 1 of the 317 patent recites “a controlled device, i.e., a set top box, that has a receiver and a transmitter for communicating with a remote controller, as well as a memory in which executable instructions for the remote controller are stored, where the claimed device performs” essentially the steps of (a) providing programming on a device for displaying instructions in response to input from a user, (b) the user providing an input on the remote control indicating that the user wants to set up the remote control, (c) accessing data (e.g., the appliance code number) associated with the device to be controlled, and (d) displaying the data (e.g., the appliance code number) to the user. Order No. 21 at 9. Because they were “virtually on all fours with *Certain Road Construction Machines*,” the claims of the 317 patent were found to be directed to an abstract idea under *Alice* step one. *Id.*

UEI now argues that “the evidence showed that the claims cover only never-before-known functionality to progress not only through interactive steps, but doing so in a manner that requires automatic testing of certain functionality to ensure a correct codeset is predetermined to work on the actual target device.” CIB at 126. As discussed above, however, the properly construed claims of the 317 patent do not recite testing to ensure a correct code set is predetermined to work on the actual target device. Instead the inventions recited in claims 3, 6, 9, and 11 select a “likely” command code set by choosing a type and brand of target device, thereby narrowing the number of possible code sets. Except for the fact that they rely on conventional electronic hardware (receiver, transmitter, and the like), the claims recite processes that could be performed by a human being with a look-up table.

Therefore, the asserted claims of the 317 patent are directed to an abstract idea under step

one of *Alice*.

c. Step Two

UEI argues with respect to *Alice* step two is that “each of the asserted claims of the 317 patent contains inventive concepts, including in its ordered combinations, that confirm that each is directed to patent-eligible subject matter.” CIB at 128-29. But UEI’s only substantive point is that the “claims require automatically progressing through multiple procedure setup steps so as to predetermine that a codeset will work with the specific target device prior to provisioning.” *Id.* Again, the asserted claims do not recite testing for predetermination of code sets for a particular target device, and thus, this argument fails.

Nor is the relevant evidentiary record much more developed than it was at the summary determination stage. In finding a genuine issue of material fact, I noted that consideration of the prosecution history and of the prior art might be helpful. *See* Order No. 21 at 12-13. The parties do not rely on the prosecution history, however, and at best the prior art simply establishes that the individual elements of the claims were “well-understood, routine, [and] conventional.” *Yu v. Apple Inc.*, No. 20-1760 (Fed. Cir. June 11, 2021) (slip op.) at 9; *see* CIB at 128-29; RIB at 111-20. Certainly the claims are all anticipated by the SVR-3000, and Roku unsurprisingly cites to that reference extensively. *See* RIB at 111-20. But eligibility and novelty are distinct inquiries, so the fact that the claims lack novelty under Section 102 does little to resolve eligibility under Section 101. *See Yu*, slip op. at 9 (“even if claim 1 recites novel subject matter, that fact is insufficient by itself to confer eligibility”). I also noted that expert evidence might be helpful (Order No. 21 at 12), but Dr. Rosenberg’s testimony on the topic is conclusory and presupposes (incorrectly) that the claims were construed to cover testing to predetermine that a code set will work with the specific target device (*see* Tr. (Rosenberg) at 1273:21-1274:23).

Dr. Balakrishnan, by contrast, provides extensive testimony, and when combined with the relevant legal precedent it is clear that the claims are ineligible under step two of *Alice*. As one example, Dr. Balakrishnan testified that “walking a user through a predetermined set of steps with instructions and asking the user to pick options, these are standard user interface techniques that were described in textbooks.” Tr. (Balakrishnan) at 753:13-16. As another example, he testified that in 2005 there were “many, many devices that will display information onto a connected display or television, and it would send instruction information as you’re stepping through whatever setup procedure that was being stepped through.” *Id.* at 762:25-763:4.

And as with *Alice* step one, the analysis under *Alice* step two is virtually the same as in *Certain Road Construction Machines*. This is readily illustrated by excerpting the operative language of the Commission’s Opinion in that case and substituting the relevant components and operations from claim 1 of the 317 patent:

[T]he [317 patent] recites the use of standard electronic components to improve the functionality of a [controlled device], and the patent discloses no innovative system for implementing the invention. Claim 1 describes and claims a generic [controlled device] that functions in a conventional way to collect, manipulate, and communicate data for [setting up a controlling device to control operational functions of the target device] using the [selected] setting data.

Certain Road Construction Machines, Comm’n Op. at 15-16; JX-0004 (317 patent) at cl. 1. As the United States Court of Appeals for the Federal Circuit put it in *Yu*, “[t]he claimed hardware configuration itself is not an advance . . . and does not add sufficient substance to the underlying abstract idea . . . [and instead] the generic hardware limitations of claim 1 merely serve as ‘a conduit for the abstract idea.’” *Yu*, slip op. at 10 (emphasis and citation omitted).

Likewise, the asserted dependent claims do not recite an inventive concept. Claim 3, which recites that the command code set is an infrared code set, presents no inventive concept because infrared command code sets are part of the “technological environment of a universal remote

control system.” RIB at 120, *citing* JX-0004 (317 patent) at 4:22-26. Dependent claim 6 requires that a “predetermined communication” from the remote control “cause[s] the controlled device to exit the plurality of setup procedure steps.” JX-0004 (317 patent) at cl. 6. This feature was a well-understood, routine, and conventional behavior of controlled devices since at least the early 1980s. *See* Tr. (Balakrishnan) at 764:24-765:15, 766:9-15; RDX-0004C.111. Dependent claim 9 requires that the instructional information comprises a series of navigable menus. JX-0004 (317 patent) at cl. 9. This claim does not recite any particular improved mechanism for such a display. *See Ameranth*, 842 F.3d at 1241-43 (claims directed to generating menus on a computer, generating, and modifying a second menu from a first menu and sending the second menu to another location for user selection did not contain an inventive concept). And the use of navigable menus on controlled devices was well-understood prior to September 8, 2005. *See* Tr. (Balakrishnan) at 729:3-18, 766:16-767:11; RDX-0004C.78, RDX-0004C.112; RX-0230 (The Essential Guide to User Interface Designs) at 249-254, 256, 271, 554, 562-564, 566-568; RX-0229 (Microsoft Windows User Experience) at 139, 141, 143, 371, 381, 383-384, 390, 391, 396, 399-408; RX-0223 (Sony SVR-3000 Installation Guide) at 41-42; RX-0221 (Sony SVR-2000 Setup Guide) at 41, 51-52. Dependent claim 11 requires that the “executable instructions are received from a remote server for storage in memory.” JX-0004 (317 patent) at cl. 11. This claim fails to recite any specific technological improvement for how the receiving from a remote source is accomplished. *See Two-Way Media Ltd. v. Comcast Cable Comms., LLC*, 874 F.3d 1329, 1337-38 (Fed. Cir. 2017) (claims must focus on how a result is achieved in a non-abstract way instead of merely reciting “result-based functional language.”). Roku presented evidence that controlled devices receiving software updates from a remote source was well understood prior to September 8, 2005. *See* RIB at 122. For example, the Sony/TiVo SVR-2000 and SVR-3000 products

received and stored automatic software updates from a remote source. RX-0595 (TiVo Viewer's Guide) at 75, 103, 105; RX-0222C (SVR-3000 Service Manual) at 11, 20; RX-0221 (Sony SVR-2000 Setup Guide) at 10, 44, 50.

Accordingly, on balance the asserted claims of the 317 patent are not patent eligible under 35 U.S.C. § 101.

VI. U.S. PATENT NO. 10,593,196

A. Level of Ordinary Skill in the Art

Unlike the 642 and 317 patents, no claims of the 196 patent have yet been construed, nor has the level of ordinary skill in that patent's art been established. *See generally* Order No. 24.

UEI asserts that a skilled artisan:

would have had a bachelor's degree that involved software design and development coursework, for example, electrical engineering, computer engineering, computer science, cognitive science, industrial engineering, information systems, information studies, or a similar degree, and at least one year of work experience in software programming, development, or design of consumer applications as of October 28, 2011, the priority date of the 196 Patent. Additional education might substitute for some of the experience, and substantial experience might substitute for some of the educational background.

CIB at 30. Roku submits that a skilled artisan would have had a bachelor's degree in electrical engineering or equivalent degree with two years of work experience relating to communications and consumer electronics. RIB at 29-30. Roku further states that UEI's proposal to include a broad range of fields, such as cognitive science, would not change any substantive analysis if adopted. RIB at 30.

Dr. Rosenberg offered no explicit opinion on the level of ordinary skill, although he did summarize the subject matter of the 196 patent as "using data to decide whether to control a target device via HDMI or to configure a remote control." Tr. (Rosenberg) at 104:12-19. Dr. Rosenberg's summary is consistent with the longest, and presumably most significant, element of

claim 1 of the 196 patent, an element which involves electronic communication, data processing, and software development and implementation. *See* JX-0005 (196 patent) at cl. 1. Roku's expert, Dr. Russ, provided a conclusory opinion on the level of ordinary skill, but he did opine that that level would be the same for both the 196 and 642 patents. *See* Tr. (Russ) at 825:10-18. Dr. Russ' opinion is not entirely on point, however, because the focus of the 642 patent, or at least asserted claim 19, is on hardware, whereas the focus of the 196 patent is on a combination of hardware and software. *See* JX-0002 (642 patent) at cl. 19. In fact, the 196 patent is seemingly closer in subject matter to the 317 patent than to the 642 patent.

On balance, while a bachelor's degree in electrical engineering and sufficient work experience would suffice to qualify as a skilled artisan in the field of the 196 patent, a more appropriate education would include at least some training in software and electronic communication, such as that available in computer engineering or computer science with a specialty in human-computer interaction. *See* Tr. (Balakrishnan) at 673:12-22 (describing the field of human-computer interaction). Therefore, a person having ordinary skill in the art of the 196 patent would have a bachelor's degree in electrical engineering, computer engineering, computer science, or equivalent degree, with two years of work experience relating to communications, consumer electronics, or human-computer interaction, and with additional experience substituting for education, and vice versa.

B. Claims-at-Issue

Claims 1, 3, 11, 13, 14, and 15 are asserted against Roku. UEI also submits that the Samsung DI Products practice claims 1 and 2 of the 196 patent. CIB at 29. These claims are reproduced below:

1. A first media device, comprising:
a processing device;

- [REDACTED]
- a high-definition multimedia interface communications port, coupled to the processing device, for communicatively connecting the first media device to a second media device;
 - a transmitter, coupled to the processing device, for communicatively coupling the first media device to a remote control device; and
 - a memory device, coupled to the processing device, having stored thereon processor executable instruction;
- wherein the instructions, when executed by the processing device, cause the first media device to be configured to transmit a first command directly to the second media device, via use of the high-definition multimedia communications port, to control an operational function of the second media device when a first data provided to the first media device indicates that the second media device when the first data provided to the first media device indicates that the second media device will be responsive to the first command, and cause the first media device to be configured to transmit a second data to a remote control device, via use of the transmitter, for use in configuring the remote control device to transmit a second command directly to the second media device, via use of a communicative connection between the remote control device and the second media device, to control the operational function of the second media device when the first data provided to the first media device indicates that the second media device will be unresponsive to the first command.
2. The first media device as recited in claim 1, wherein the second media device comprises a media source device for the first media device acting as a media sink device and wherein the first media device receives media data from the media source device via use of the high-definition multimedia interface communications port.
 3. The first media device as recited in claim 1, wherein the second media device comprises a media sink device for the first media device acting as a media source device and wherein the first media device transmits media data to the media sink device via use of the high-definition multimedia interface communications port.
 11. The first media device as recited in claim 1 wherein transmitter comprises a radio frequency (RF) transmitter.
 13. The first media device as recited in claim 1, wherein the first data provided to the first media device comprises data indicative of a success status of a test command that was transmitted to the second media device.
 14. The first media device as recited in claim 13 wherein the test command is transmitted to the second media device by the first media device via use of the high-definition multimedia interface communications port.

15. The first media device as recited in claim 13, wherein the test command comprises a command transmitted to test a volume functional operation of the second media device.

JX-0005 (196 patent) at cls. 1, 2, 3, 11, 13, 14, and 15.

C. Claim Construction

No claims of the 196 patent that remain asserted have been construed, nor does either party seek any such construction. *See* CIB at 30; RIB at 29; Order No. 24 at 16 n.3.

D. Standing

Five months after the present complaint was filed the parties became aware that Mr. Brian Barnett, a UEI employee, is a joint inventor of the 196 patent. *See generally* Order No. 40 (February 1, 2021). Mr. Barnett was not originally named as an inventor, and thus, also did not assign his rights to the patent to UEI at the time the application was filed. Upon learning of the omission, UEI filed a petition with the U.S. Patent and Trademark Office (“the USPTO”) to correct the inventorship of the 196 patent, and at the same time Mr. Barnett executed an assignment of his rights in the 196 patent to UEI. The USPTO then issued a Certificate of Correction adding Brian Barnett as an inventor. CX-1393. In light of the timing of Mr. Barnett’s assignments to the patent at issue, Roku moved for summary determination that UEI lacked standing to assert the 196 patent. I granted this motion in Order No. 40, but by an Opinion dated March 3, 2021, the Commission reversed and remanded. Comm’n Op., EDIS Doc. No. 735072 (Mar. 3, 2021).

The background to this standing issue is as follows. The 196 patent claims priority to several prior applications, some of which name both Mr. Arling and Mr. Barnett as inventors, while others name only Mr. Arling:

CONFIDENTIAL MATERIAL OMITTED



Mr. Barnett and Mr. Arling are the inventors of the original 857 Provisional Application, the 876 Provisional Application, and the 176 Application; and they executed assignments to UEI that were timely filed with the USPTO. JX-0410C at 4-9; JX-0411C at 4-9 (“the 2012 Barnett Assignments”). The Commission found that there is “no dispute that the 2012 Barnett Assignments expressly operate as a present conveyance . . . of Mr. Barnett’s entire right, title, and interest in the invention disclosed in each Priority Application.” Comm’n Op. at 13 (citation omitted). Thus, the Commission found that Roku was not entitled to summary determination that UEI lacked standing to assert the 196 patent. However, the Commission did not find as a matter of law that UEI has standing to assert the 196 patent. Rather, the Commission found “that [Roku] has not demonstrated that it is entitled to summary determination as a matter of law that UEI was not the rightful owner of all substantial rights in the ’196 patent at the time it filed its complaint and thus lacked standing to assert the ’196 patent in this investigation.” *Id.* at 1.

At the hearing, Mr. Barnett testified that “it was always my understanding that I had no ownership of the [196] patent from the start of my employment” at UEI. Tr. (Barnett) at 74:1-5. Roku did not present evidence to the contrary, or indeed, any new evidence at all. See RIB at 30-38. Thus, there is no basis to disturb the Commission’s substantive conclusions, and UEI has standing to assert the 196 patent.

E. Design-Around Products –Revised Roku Products

As briefly discussed, Roku alleges that it designed, implemented, and imported “Revised Roku Products” that do not infringe the 196 patent. RIB at 42. Roku submits that these design-around products do not infringe the 196 patent because they fail to “satisfy claim 1’s recited prioritization for control via HDMI-CEC over control via configuring the remote.” *Id.* UEI argues, on the other hand, that the Revised Roku Products infringe the 196 patent “in the same manner as the original Roku Ultra and Roku Soundbar products.” CIB 38-39. UEI further argues that adjudication of the Revised Roku Products is an improper advisory opinion. *Id.* at 50.

The Commission has held:

[T]hat the test for determining whether a respondent has met its burden for adjudication of a redesigned or alternative product includes four factors: (1) whether the product is within the scope of the investigation; (2) whether it has been imported; (3) whether it is sufficiently fixed in design; and (4) whether it has been sufficiently disclosed by respondent during discovery. See *Two-Way Radio*, 2018 WL 8648379 at *13-14.

Certain Human Milk Oligosaccharides and Methods of Producing the Same, Inv. No. 337-TA-1120, Comm’n Op. at 18 (June 8, 2020) (“*Oligosaccharides*”). The Commission clarified that it has a standing “policy in favor of adjudicating redesigns to prevent subsequent and potentially burdensome proceedings that could have been resolved in the first instance in the original Commission investigation” (*id.*) and, despite factor (2) in the excerpt above, redesigns do not actually need to be imported at all (*id.* at 18 n. 21); but see *Certain Dental and Orthodontic*

Scanners and Software, Inv. No. 337-TA-1144, Comm’n Op. at 8 (Dec. 3, 2020) (confirming “affirmative” evidence of importation is necessary for an accused product)). As an example of the flexibility on this issue, the Commission held in *Oligosaccharides* that two documents produced without explanation from the producing party during fact discovery (and one, a patent application containing no reference to the redesigned product name) qualified as “sufficient” discovery under factor (4). *See id.* at 14-15, 20-23. The Commission also held, in a determination that adjudication of a redesign was warranted, that evidence of actual importation outweighed a request for admission (“RFA”) response that importation had not occurred. *See id.* at 15, 20.

Three of the four factors enumerated above are not in dispute. First, the Revised Roku Products are within the scope of the investigation, which includes televisions, set-top boxes, remote control devices, streaming devices, and sound bars. *See* 85 Fed. Reg. 31211. The second factor, importation, also is met. *See* RX-0652C (Mendenhall Dep.) at 278:7-16; RX-0285 (FedEx label); RX-0286 (FedEx tracking report); *see also* RPX-0001C (design-around Roku Ultra); RPX-0002C (design-around Roku Streaming Stick); RPX-0003C (design-around Roku Smart Soundbar). Mr. Mendenhall specifically testified that the three design-around products “were imported from Cambridge, England.” RX-0652C (Mendenhall Dep.) at 278:15-16. The fourth factor, whether the product has been sufficiently disclosed by Roku during discovery, is also met. Roku produced to UEI a preliminary feature guide that describes the design-around functionality, produced two source code files with the final version of the design-around, and produced physical products implementing the design-around. RIB at 45. Roku also offered its expert, Mr. Mendenhall, to testify about the design-around after it was disclosed to UEI. *Id.* UEI does not challenge the sufficiency of this discovery, nor does it challenge the first two factors. CIB at 50-52.

[REDACTED]

The third factor, “fixed in design,” is in dispute, however. UEI argues that the Revised Roku Products are not sufficiently fixed in design because “the actual implementation of the Revised Roku Products is inconsistent with the description found in Roku’s feature guide on the product (JX-0288C).” CIB at 50. Specifically, UEI submits that “the feature guide represents that the remote setup flow will [REDACTED]

[REDACTED] CIB at 50-51. However, UEI contends that, according to the source code, the setup process will actually proceed [REDACTED] [REDACTED] to configure the remote. *See id.* at 51. Thus, “the sole piece of non-source code evidence as to how the products operate is incorrect, further demonstrating that the Revised Roku Products are not fixed in design nor sufficiently disclosed.” *Id.*

Roku, on the other hand, argues that it “produced three physical Roku Design-around Products which UEI could – and its counsel did – inspect.” RIB at 43; *see* RX-0023C at 8, 14. And Roku submits that whether the feature guide is accurate is not relevant to the inquiry. Roku states that “the source code itself is the actual implementation of the Roku Design-around Products.” RRB at 21. As Roku clarifies, “the Feature Guide was only meant to be a high-level, preliminary description of the features Roku planned to implement.” RIB at 44; Tr. (Mendenhall) at 502:8-503:8, 504:1-16.

UEI also contends that the Revised Roku Products are not sufficiently fixed in design “[b]ecause the source code build in the [Revised Roku Products] will never be present in any commercially imported or sold product.” CIB at 52. UEI apparently bases this contention on the allegation that “Roku has not taken any of the steps necessary to release the Revised Roku Products to its factories.” *Id.* at 51. But this is not the test for showing that an alleged redesign is sufficiently fixed. *See, e.g., Certain Unmanned Aerial Vehicles and Components Thereof*, Inv. No. 337-TA-

1133, Comm’n Op. at 24 (September 8, 2020) (“[T]he Commission does not require that a redesign involve a commercial product in order to be adjudicated.”).

Accordingly, the Revised Roku Products are sufficiently fixed in design. Moreover, the prerequisites to adjudication have all been established, and the Revised Roku Products will be adjudicated.²

F. Infringement

UEI alleges that Roku directly infringes claims 1, 3, 11, 13, 14, and 15 of the 196 patent by making, using, offering to sell, selling, selling for importation, and importing the Roku Ultra, Revised Roku Ultra, Roku Soundbar, and Revised Roku Soundbar (collectively the “Roku 196 Accused Products”). CIB at 34. Originally, UEI also accused the Roku Streaming Sticks of infringing the 196 patent; however, these products are no longer accused of infringement. RIB at 38. For the reasons discussed below, UEI has shown infringement of claims 1, 3, 11, and 13-15 by certain products.

Claim 1 of the 196 patent is the only independent claim asserted, claims 3, 11, and 13 depend directly from claim 1, and claims 14 and 15 depend from claim 13. The 196 patent relates to systems for “appliance control via use of a controlling device, such as a remote control, smart phone, tablet computer, etc.” JX-0005 (196 patent) at 1:67-2:1. The 196 patent teaches that a Universal Control Engine (“UCE”) selects the best method of sending commands to the target appliance – either through the wired HDMI connection (which implements Consumer Electronic

² Roku presents no evidence, and does not claim, that it has revised all accused products, including the Nemo, Marlin 4K, Chico, Littlefield, Gilbert, Cooper, Austin, Tyler, Mustang, and Dallas (Tr. (Mendenhall) at 521:4-522:6). Thus, the only Revised Roku Products at issue are the Roku Ultra (Bryan 2) and Roku Soundbar (Fruitland).

Control, or “CEC,” protocols) between the set-top box and the target appliance or through a path directly from the set-top box’s remote controller to the target appliance. *Id.* at Abstract, 2:7-45.

1. Functionality

The functionality of the Roku Ultra and Roku Soundbar is described above. Roku submits that its revised products “modify the [REDACTED] to obviate UEI’s infringement arguments.” RIB at 41. According to Roku “[w]hereas the original Roku Streaming Boxes and Soundbars may [REDACTED] the design-around products [REDACTED] *Id.*, citing Tr. (Mendenhall) 498:11-22’ Tr. (Lipoff) 556:18-557:1; RDX-0007C.30 (design-around flowchart); JX-0228C (Design-Around Feature guide). UEI, however, submits that the Revised Roku Products also have the feature that if [REDACTED] is unsuccessful (as indicated by the user feedback), the Revised [Products] will prompt the user to manually enter a brand and then proceed to [REDACTED] with the newly selected brand.” CIB at 38-40, citing Tr. (Mendenhall) at 498:11-499:24.

2. Claim 1

a. Roku Ultra and Soundbar

The Roku Ultra and Soundbar are media streaming devices (i.e., “first media device[s]”) that each possess a system on a chip (i.e., “processing device”), an HDMI port coupled to the processing device for communicating with a second media device, a transmitter coupled to the processing device for communicating with a remote control device, and a memory device coupled to the processing device for storing executable instructions. *See* Tr. (Rosenberg) at 127:8-129:11. In fact, the only disputed limitation is the last “wherein” clause of claim 1. CIB at 40-42. UEI asserts that both the Roku Ultra, which controls the power and volume functions of an attached TV, and the Roku Soundbar, which controls the power functions of an attached TV, meet this

limitation as summarized in the annotated claim (the Roku devices and functionality are in bold brackets):

wherein the instructions, when executed by the processing device, cause the first media device [**Roku Ultra or Soundbar**] to be configured to transmit a first command [**mute signal from Ultra or Power Off from Soundbar**] directly to the second media device [**TV**], via use of the high-definition multimedia communications port [**via HDMI cable to the TV**], to control an operational function of the second media device when a first data [**user indicates yes TV is muted or Off**] provided to the first media device indicates that the second media device will be responsive to the first command, and cause the first media device to be configured to transmit a second data [**code set to configure the remote control**] to a remote control device, via use of the transmitter, for use in configuring the remote control device [**configuring the remote to send an IR mute command**] to transmit a second command [**IR command**] directly to the second media device, via use of a communicative connection [**IR**] between the remote control device and the second media device, to control the operational function of the second media device when the first data [**user says TV is not muted or On**] provided to the first media device indicates that the second media device will be unresponsive to the first command.

Dr. Rosenberg testified that the Roku Ultra and Soundbar receive user feedback to confirm the success or failure of the test CEC command (is TV muted? or is TV off?), which is passed into the function [REDACTED] CIB at 42, citing Tr. (Rosenberg) at 130:2-131:17; 132:20-134:21. UEI asserts that the user feedback is the claimed “first data.” CIB at 42. If the CEC test is successful (*i.e.*, the user selected “yes” and a [REDACTED], the accused product (the first media device) is configured to transmit CEC commands (a first command) directly to the attached TV (the second media device) via the HDMI connection to control that TV. *See* Tr. (Rosenberg) at 130:2-131:17.

If the first data instead indicates that the CEC test was unsuccessful and the TV is not muted or turned off, the user selects “no” and a [REDACTED] [REDACTED] Tr. (Rosenberg) at 131:18-134:21. In this situation, the Roku devices will send data (“test code sets”) to the remote for use by the remote to send IR

commands from the Roku remote directly to the TV. *Id.* UEI submits that the sending of code sets and commands in this manner allows the remote to be “configure[d] . . . to transmit a second command.” *See* CIB at 43; Tr. (Lipoff) at 548:19-24 (“So the IR command is automatically sent . . . as soon as you enter no. And then if . . . that works, the end user will confirm that . . . and you’ll configure the remote to control the TV via IR codes.”). The process is iterative; the Ultra and Soundbar may transmit multiple codes to the remote to identify a working code set. *See* Tr. (Rosenberg) at 134:10-21 (“if the CEC test was false . . . it would go through and configure IR commands and ultimately arrive at an IR codeset that works”); Tr. (Balakrishnan) at 772:4-9 (Q. “Okay. You do know that the Roku products, though, do perform iterative testing of successive IR command codes for use in configuring the remote control to connect another device by IR; is that right?” A. “Well, it only does it for televisions. Only one type of device, yes, one type of device, yes.”). If no working code set is found, the user may abandon the process or start over by identifying a different brand. *See* Tr. (Lipoff) at 549:5-11.

Such evidence strongly supports UEI’s infringement allegations. For the first half of the “wherein” element of claim 1, Roku’s expert, Mr. Lipoff, succinctly describes how both the Ultra and the Soundbar operate consistently with that element:

[Y]ou start off with testing the CEC command at the top, and then you make a determination with the branch to the left where the user confirms the CEC actually works, in which case you proceed to the yes branch on the left and you configure the [Roku product] according to CEC.

However, if that CEC command does not result in the [Roku product] being configured by CEC, you take the branch to the right.

Tr. (Lipoff) at 548:4-12 (referring to RDX-0007C.21), 549:12-14. Roku argues, however, that because the same term – “first data” – is used in both the “responsive” and “unresponsive” cases, claim 1 necessarily requires that the data used to decide whether to send a command via HDMI is

the same data that is “used to decide whether to send a command via configuring the remote control.” RIB at 39. But according to Roku, the Ultra and Soundbar “do not configure the remote to control a second media device using the ‘first data’ as required by the claim.” RIB at 39.

Roku mischaracterizes the claim’s requirements, and to the extent Roku’s position implicates claim construction, its proposed construction is rejected. The first data is the original “yes” or “no” from the user indicating whether the first HDMI test signal was successful: the “first data provided to the first media device indicates that the second media device will be” responsive or unresponsive “to the first command.” JX-0005 (196 patent) at cl. 1. Once that first data is sent to the first media device, it is “used to decide” which branch of the decision tree to follow, HDMI/CEC or IR, and then becomes irrelevant. RIB at 39. That is precisely how the first data is used in the Ultra and Soundbar. *See* Tr. (Lipoff) at 548:4-12. The first data is not used to “configure the remote to control a second media device,” because that is what the “second data” is for: the executed instructions “cause the first media device to be configured to transmit a second data to a remote control device . . . for use in configuring the remote control device . . . to control the operational function of the second media device.” RIB at 39; JX-0005 (196 patent) at cl. 1.

In other words, the executed instructions must “cause the first media device to be configured” to perform a particular operation, namely, “transmit[ting] a second data to a remote control device,” where the transmitted second data is “for use in configuring the remote control device” to perform its own particular operation, namely, “transmit[ting] a second command directly to the second media device . . . to control the operational function of the second media device.” JX-0005 (196 patent) at cl. 1. There is no requirement that the second data actually “change the configuration of the remote control.” RIB at 39. It is enough that the second data is

“for use in configuring the remote control device” to perform its particular operation. JX-0005 (196 patent) at cl. 1.

Nor is there any limitation on when the “second command” is sent or whether the “second command” is demonstrably successful at “control[ing] the operational function of the second media device.” JX-0005 (196 patent) at cl. 1. The claim requires that (1) the specific executed instructions cause the first media device to be configured to transmit the second data, (2) the second data is for use in configuring the remote control to transmit a second command, (3) the purpose of the second command is to control the operational function of the second media device, and (4) the processing device executes these specific instructions “when the first data . . . indicates that the second media device will be unresponsive” to HDMI/CEC. *Id.* It is irrelevant that there may be “additional data” communicated between receipt of the first data and (actual) transmission of the second data, so long as the first media device is configured according to the claim. RRB at 18. It is also irrelevant that the second data does not by itself “cause any changes to the configuration of the remote control,” so long as the second data is “for use in configuring the remote control device” to transmit a second command, and the purpose of the second command is “to control the operational function of the second media device.” *Id.*; JX-0005 (196 patent) at cl. 1.

Given this interpretation of the claim language – and again, to the extent Roku’s position implicates claim construction, its proposed construction is rejected – the evidence shows that the Roku Ultra and Soundbar practice the second half of the “wherein” clause. As Dr. Rosenberg explained:

Q. Now during the setup process, if the CEC test fails, the Roku player then uploads the test IR code to the remote, right?

A. Yes, it does.

Q. And then the remote transmits that test IR code to the TV, right?

A. It does, but it's not a blind repeating of that. It changes it from WiFi direct to make a temporary configuration in that remote, changes it to IR format, and then transmits it in IR format.

Tr. (Rosenberg) 209:12-21. In other words, if the “first data” indicates “unresponsive” (i.e., “if the CEC test fails”), the “first media device” (i.e., “the Roku player”) is “configured to,” and actually does, “transmit the second data” (i.e., “the test IR code”) “for use in configuring the remote control” (i.e., the test IR code is “upload[ed] . . . to the remote”) to “transmit a second command” (i.e., “the test IR code”), the purpose of which “to control the operational function of the second media device.”

Although Mr. Lipoff does not agree that this process qualifies as “configuration,” temporary or otherwise, his description is very similar to Dr. Rosenberg’s:

Q. So in your opinion is the test command used in configuring the remote control device?

A. No, there's no configuration with respect to how I think someone would understand configuration.

. There's no configuration that occurs in either of the two microcontrollers or anything in the remote at all.

Tr. (Lipoff) 553-12-21 (emphasis mine). Inasmuch as the parties dispute whether “tak[ing] the RF coming from the Roku Box [and] converting it to IR” qualifies as “configuring” the remote control, the specification and Figure 2 of the 196 patent demonstrate that it does: “a setup app . . . may be utilized . . . to *initially configure* [the claimed invention] for operation with the specific group of appliances to be controlled, i.e., *to communicate to [the claimed invention] a matching command code set* and capability profile for each particular appliance to be controlled.” *Id.*; JX-0005 (196 patent) at 4:50-58 (emphasis added).

In short, receiving code set data via incoming RF signals, and then converting it to be transmissible via IR, amounts to “configuring the remote control device to transmit a second command,” as recited in claim 1. JX-0005 (196 patent) at cl. 1. And it is beside the point whether the code set data actually works, either the first time or after multiple attempts, and the remote control is thereafter configured some more to use that working code set. *See* Tr. (Lipoff) at 548:21-24 (“if that works . . . you’ll configure the remote to control the TV via IR codes”). As Dr. Rosenberg testified, the second data can “be the first and the full provisioning or either one or both.” Tr. (Rosenberg) at 137:11-13.

Accordingly, the evidence shows that the Roku Ultra and Roku Soundbar infringe claim 1 of the 196 patent.

b. Revised Roku Products

The Revised Roku Products were the subject of testimony from Roku’s expert, Mr. Lipoff, but apparently not from UEI’s expert, Dr. Rosenberg. *See* CIB at 47-48. Mr. Lipoff explained the operation of the Revised Roku Products by reference to a block diagram:

CONFIDENTIAL MATERIAL OMITTED



RDX-0007C.31. The process starts by

[REDACTED]

[REDACTED] Tr. (Lipoff) at 557:7-10. “[O]nly after you’ve exhausted [REDACTED]

[REDACTED] *Id.* at 558:1-3. According to Mr. Lipoff’s

diagram, if the [REDACTED] is successful, all the equipment is [REDACTED]

RDX-0007C.31. UEI correctly asserts that this latter portion of the process corresponds to the first half of the “wherein” element of claim 1, because “the Revised Roku Ultra and the Revised Roku Soundbar will [REDACTED] of the attached TV in response to [REDACTED] CIB at 47; *see* Tr. (Lipoff) at 592:21-593:3.

The second half of the “wherein” element, however, is implemented in the revised products rather differently. Claim 1 requires that the “executable instruction[s]” cause the first media device “to be configured to transmit” either a “first command” or a “second data,” depending on the content of the “first data.” JX-0005 (196 patent) at cl. 1. More precisely, “when the first data . . .

[REDACTED]

indicates that the second media device will be unresponsive to the first command” (i.e., the user response to [REDACTED] is “No”), the “executable instruction[s]” must cause the first media device “to be configured to transmit a second data to a remote control device” for configuring the remote control device. *Id.*; RDX-0007C.31. But that is not how the executable instructions cause the accused first media devices (i.e., Roku Revised Products) to be configured; instead, the Roku Revised Products are configured to transmit a prompt to the user to select either “Give Up” or “Try Again.” RDX-0007C.31.

Admittedly, in this process the Roku Revised Products [REDACTED] that is, they become “configured to transmit a second data to a remote control device . . . for use in configuring the remote control device to transmit a second command directly to the second media device,” either initially or, at the user’s option, [REDACTED] *See* RDX-0007C.31; JX-0005 (196 patent) at cl. 1. According to UEI, the addition of [REDACTED] before the normal [REDACTED] is of no moment to the infringement analysis” because claim 1 does not preclude tests prior to the claimed functionality. CIB at 47. *Id.* UEI contends that the [REDACTED] causes the revised Roku product to present the user with [REDACTED] which includes sending the second data to the remote.” *Id.* at 48.

While the addition of an [REDACTED] at the beginning of the setup process is not the determinative factor in the infringement analysis, the evidence does not show that the Revised Roku Products infringe claim 1. The “first data” as defined in the claim is not the data that triggers the executable instructions to cause the Revised Roku Products to transmit the second data (i.e., the [REDACTED] to the remote control device a second time. Instead, what triggers the sending of the [REDACTED] with a different identified

██████████ The user's request that the processing device ██████████ is not the same "first data" as that sent ██████████

Therefore, the Revised Roku Products do not satisfy the requirements of claim 1.

3. Dependent Claims 3, 11, and 13-15

The Revised Roku Ultra and Revised Roku Soundbar do not infringe the dependent claims, for the same reason that they do not infringe claim 1. However, since the original Roku Ultra and Soundbar do infringe claim 1, further analysis is necessary. UEI prepared a chart to illustrate how each of these asserted claims re infringed. *See* CIB at 49-50. The following is an updated version of UEI's chart, which eliminates discussion of the Revised Roku Products.

Claim	Roku's Infringement	Supporting Evidence
3. The first media device as recited in claim 1, wherein the second media device comprises a media sink device for the first media device acting as a media source device and wherein the first media device transmits media data to the media sink device via use of the high-definition multimedia interface communications port.	The Roku Ultra, and Roku Soundbar (first media devices) transmit media data (video and audio), thereby acting as media source devices, to the TV (the second media device), which receives the media and thereby acts a media sink device, via the HDMI port in the Roku devices.	Tr. (Rosenberg) at 137:19-138:15; 138:16-25.
11. The first media device as recited in claim 1, wherein the transmitter comprises a radio frequency (RF) transmitter.	The Roku Ultra, and Roku Soundbar include WiFi transmitters (Realtek RTL8812 for Ultra and Realtek RTL8822/8811 for Soundbar), which are radio frequency (RF) transmitters.	<p>Roku Ultra: Tr. (Rosenberg) at 128:7-12; JX-0102C.</p> <p>Soundbar: Tr. (Rosenberg) at 129:4-8; CX-0404C.</p> <p>All: Tr. (Rosenberg) at 137:19-138:15; 139:1-10; CX-0370C (Daly) at 39:7-40:11; 50:11-54:1; 57:2-16.</p>

13. The first media device as recited in claim 1, wherein the first data provided to the first media device comprises data indicative of a success status of a test command that was transmitted to the second media device.	As part of the “Set up remote for TV control” functionality the Roku Ultra and Roku Soundbar receive feedback from the user as to whether the CEC test command that was transmitted from the Roku device to the TV was successful. The user selects from a menu whether the TV muted (Roku Ultra) or the TV turned off (Roku Soundbar).	All: Tr. (Rosenberg) at 130:2-137:13; 137:19-138:15; 139:11-21; CPX-0115C; JX-0024.
14. The first media device as recited in claim 13, wherein the test command is transmitted to the second media device by the first media device via use of the high-definition multimedia interface communications port.	The Roku Ultra and Roku Soundbar transmit a CEC test command from the Roku device to the attached TV via the HDMI port in the Roku device.	Roku Ultra: JX-0102C. Soundbar: CX-0404C. All: Tr. (Rosenberg) at 130:2-137:13; 137:19-138:15; 139:11-140:1; JX-0222C.5.
15. The first media device as recited in claim 13, wherein the test command comprises a command transmitted to test a volume functional operation of the second media device.	The Roku Ultra uses a CEC mute command (a volume functional operation) to test whether CEC commands are operable.	Tr. (Rosenberg) at 130:2-137:13; 137:19-138:15; 139:11-21; 140:2-9; CPX-0115C; JX-0024.

CIB at 49-50.

Roku does not dispute the allegations made in the chart, and they are otherwise meritorious. *See* RRB at 20. Therefore, the Roku Ultra and Soundbar Accused Products infringe claims 3, 11, 13, and 14 of the 196 patent, the Roku Ultra further infringes claim 15, and the Revised Roku Ultra and Revised Roku Soundbar do not infringe any claim.

G. Domestic Industry – Technical Prong

1. The Samsung DI Products are Protected by the 196 and 317 Patents

As noted, the Samsung DI Products are protected by the 196 and 317 patents.

2. Samsung DI Products Practice Claims 1 and 2 of the 196 Patent

UIE asserts that the Samsung TVs that include UEI's QuickSet software and the Samsung smart remote are the Samsung DI Products that practice claims 1 and 2 of the 196 patent. CIB at page 52. The representative models are the Samsung RU8000 and TU8000 models.

a. Claim 1

As with the infringement analysis above, the only dispute between the parties regarding the technical prong of domestic industry issue is whether the Samsung DI Products practice the last "wherein" clause of claim 1. This is discussed below. For those remaining limitations that are not in dispute, UEI has shown that the Samsung DI Products practice the limitations as alleged in view of the testimony of Dr. Rosenberg, as shown by the table below:

Limitation	Samsung DI Products	Supporting Evidence
1. A first media device, comprising:	The Samsung DI Products are media devices. They display media and produce audio.	CX-0655
[1(a)] a processing device;	The Samsung DI Products include a processing device.	CX-0645C.10; Tr. (Rosenberg) at 173:10-15, 174:9-13.
[1(b)] a high-definition multimedia interface communications port, coupled to the processing device, for communicatively connecting the first media device to a second media device;	The Samsung DI Products include an HDMI port that is coupled to the processor for connecting the TV to a second media device.	CX-0647C.5; Tr. (Rosenberg) at 173:16-21, 174:9-13.
[1(c)] a transmitter, coupled to the processing device, for communicatively coupling the first media device to a remote control device; and	The Samsung DI Products include a transmitter that is coupled to the processing device for communicatively coupling the TV to the Samsung remote control.	CX-0646C.19; CX-0647C; CX-0642.7; Tr. (Rosenberg) at 173:22-174:2; 174:9-13.
[1(d)] a memory device, coupled to the processing device, having stored thereon processor executable instruction;	The Samsung DI Products include a memory device that is coupled to the processor that stores executable instructions.	CX-0642; CPX-0118; Tr. (Rosenberg) at 174:3-7, 174:9-13.

See CIB at 59.

The “wherein” clause is, again:

wherein the instructions, when executed by the processing device, cause the first media device to be configured to transmit a first command directly to the second media device, via use of the high-definition multimedia communications port, to control an operational function of the second media device when a first data provided to the first media device indicates that the second media device when the first data provided to the first media device indicates that the second media device will be responsive to the first command, and cause the first media device to be configured to transmit a second data to a remote control device, via use of the transmitter, for use in configuring the remote control device to transmit a second command directly to the second media device, via use of a communicative connection between the remote control device and the second media device, to control the operational function of the second media device when the first data provided to the first media device indicates that the second media device will be unresponsive to the first command.

JX-0005 (196 patent) at cl. 1. The Samsung DI Products send CEC commands directly to peripheral devices such as an AVR or cable box via the HDMI port to control operational functions (e.g., volume, power) when the universal remote setup procedure determines that CEC communications will successfully control those functions. See Tr. (Rosenberg) at 163:4-172:6, 174:14-176:3. The Samsung DI Products also configure the Samsung smart remote (via Bluetooth) to transmit IR commands directly to the peripheral devices (i.e., AVR or cable box) when the universal remote setup procedure determines that CEC control will not work. See Tr. (Rosenberg) at 166:22-169:24.

Roku asserts that UEI failed to prove that the Samsung TVs containing QuickSet software practice claim 1, primarily because no analysis of the source code showing how the TVs actually operate was performed. RIB at 48. Therefore, Roku argues, without the source code, there is no way to show that the Samsung TV use the same “first data” to determine whether to use CEC or IR control, and merely watching the operation results is speculation. *Id.* at 49. Roku also argues

that Dr. Rosenberg's testing was not adequate because he did not observe all branches of the claimed algorithm. *See* RIB at 49.

UEI's expert was not the only witness to discuss how the representative Samsung TV containing QuickSet operates, however; the developer of the Quickset software, Mr. Barnett, also testified as to how it operated. *See* Tr. (Barnett) at 32:6-19 (Mr. Barnett was "instrumental in the development of QuickSet" and has worked on the product continuously, "all the way through today"). He testified that the QuickSet software used in the Samsung DI Products control rule controls the setup procedure. *See* Tr. (Barnett) at 57:10-58:24. Mr. Barnett testified that if the QuickSet control rule indicates that a peripheral device (the second media device), such as a Denon AVR, will be responsive to CEC then the Samsung TV will configure itself to issue CEC commands, and if the control rule indicates that the Denon AVR will not be responsive to CEC control then the Samsung TV will proceed to IR configuration. *See id.* at 59:3-23.

Overall, such evidence is sufficient to show that claim 1 reads on the Samsung DI Products. Accordingly, the Samsung TVs containing UEI's QuickSet software practice claim 1 of the 196 patent.

- b. Claim 2 – The first media device as recited in claim 1, where the second media device comprises a media source device for the first media device acting as a media sink device and wherein the first media device receives media data from the media source device via use of the high-definition multimedia interface communications port.**

Roku's only argument regarding this claim is that since claim 2 depends from claim 1, UEI "has failed to show that the Samsung TVs practice claim 2 as well." RIB at 49. At the same time, though, UEI's evidence is thin. Dr. Rosenberg's testimony regarding claim 2 is conclusory, and his one demonstrative exhibit on the topic merely identifies the Samsung TV as the first media device, two peripheral devices as the second media devices, and HDMI cables connecting them.

See Tr. (Rosenberg) at 176:4-13; CDX-0002C.44. Nonetheless, Dr. Rosenberg elsewhere identifies the second media device, in one instance as a cable box. See Tr. (Rosenberg) at 175:18-25. It stands to reason that there are numerous instances of a Samsung TV (first media device) being connected to a cable box (second media device) via HDMI such the Samsung TV “receives media data” in the form of TV signals from the cable box, the Samsung TV thereby acts as a “media sink,” and the cable box thereby acts as a “media source.”

Therefore, the Samsung TVs containing UEI’s QuickSet software can and do practice claim 2 of the 196 patent when connected to a media source controllable by the Samsung TV, including a cable box.

H. Validity

Roku asserts that the 196 patent is obvious under 35 U.S.C. § 103 in view of the combination of U.S. Patent Appl. Pub. No. 2012/0249890 to Chardon (RX-0488) (“Chardon”) and Mishra (U.S. Patent Appl. Pub. No. 2001/0005197A) (JX-0316), and optionally HDMI 1.3a (RX-1077). See RIB at 54. According to Roku:

Chardon discloses a multi-media gateway and other media devices that control target devices using an IR blaster or the HDMI-CEC bus, as well as mechanisms that use data (*e.g.*, HDMI response or identity data) to decide whether to use IR or CEC to control a particular operation of a specific device. . . . Chardon also discloses a remote control that has a transceiver, and that receives, stores, and transmits IR codes (*id.* ¶ 43), but does not explicitly teach that IR codes are sent from a media device to configure the remote control to control other devices. However, Mishra discloses an intermediating device that controls target devices by sending IR codes and protocols to a remote control which can then store and transmit (*i.e.*, relay) the IR codes to a target device. . . . It would have been obvious to modify Chardon to relay IR codes through its remote control rather than sending them through an IR blaster, based on: (a) Chardon’s disclosure of a remote that can receive/transmit IR codes, (b) Mishra’s disclosure of a remote that relays IR codes through a remote control, (c) and the background knowledge of a POSA of the disadvantages of IR blasters as compared to relaying.

RIB at 50 (internal citations deleted).

Although Chardon and the HDMI 1.3a reference are cited on the face of the 196 patent, the prosecution history shows that Chardon was filed in an Information Disclosure Statement that contained over 50 other references. CX-0152C.0070-75. Moreover, neither of these references was ever substantively discussed during prosecution of the 196 patent. *See generally* CX-0152C. Thus, the disclosure of these references during prosecution does not limit the weight given to them.

1. Chardon

Chardon was filed on March 31, 2011, which is before October 28, 2011, the earliest priority date of the 196 patent. *See* RX-0488 (Chardon). Thus, Chardon is prior art under pre-AIA 35 U.S.C. § 102(e)(1).

Chardon relates to remote-control systems that are “configured to operate on a variety of remote control platforms, such as High Definition Multi-Media Interface appliances.” RX-0488 (Chardon) at ¶ 1. It discloses various HDMI appliances 105 such as a display, set-top box, and DVD player, “a multi-media gateway” 110, and remote control device 115. *Id.* at ¶¶ 29-31, Fig. 1. All of these have a “remote-control system 140” and “remote control engine 145,” which can control the other devices in the system. *Id.* at ¶¶ 6, 36, 38-41, 43, 45, Fig. 1; Tr. (Russ) at 876:11-877:17. The remote control engine is software that selects the command code (IR or CEC) for controlling a particular operation of a target device. *See* RX-0488 (Chardon) at ¶¶ 16, 26-27, 39-40, 88; Tr. (Russ) at 892:7-895:1.

Chardon discloses embodiments that choose between IR and CEC codes in one of two ways. First, the “remote control system” may monitor the CEC bus for a response issued from an HDMI appliance in response to receipt and execution of a CEC command code, and if a response is not issued from the HDMI appliance, the remote control system determines an IR command code that corresponds to the CEC command code for the HDMI appliance, and transmits that IR command code to the HDMI appliance to perform a function associated with the CEC command

code. RX-0488 (Chardon) at ¶¶ 12, 58, Fig. 5, elements 510-530; Tr. (Russ) at 896:3-25. The remote control system stores the success or failure of CEC commands and associates the target device with CEC and/or IR codes for use in future attempts to control the same operation of that device. *See* RX-0488 (Chardon) at Abstract, ¶¶ 14, 20, 33-34, 58-59, 68; Tr. (Russ) at 898:21-901:11.

Second, Chardon teaches that the remote control system may obtain an EDID (Extended Display Identification Data Standard (EDID)) or CEC vendor ID from a connected device, which can be used to determine whether the second device will be responsive or unresponsive to specific CEC commands. RX-0488 (Chardon) ¶¶ 10, 11, 20, 49, 50, 59. The remote control system (Roku refers to this as the first media device) transmits this CEC command directly to a target device (i.e., the second media device) when the CEC vendor ID (i.e., first data) indicates that the target device supports vendor specific commands (i.e., will be responsive to the first command). RIB at 51-52, *citing* RX-0488 (Chardon) at ¶¶ 10, 12, 49, 62; Tr. (Russ) at 922:1-927:16. If it is “determine[d] from the remote server that a given HDMI appliance is not configured to receive CEC command codes,” the system will “send IR command codes” instead. RX-0488 (Chardon) at ¶¶ 60, 69.

2. Mishra

Mishra is prior art to the 196 patent under at least pre-AIA 35 U.S.C. §§ 102(a), 102(b), and 102(e)(1) because it was filed on February 17, 2001 and published on June 28, 2001, both dates being more than one year before October 28, 2011. JX-0316 (Mishra) at 22, 43. Mishra is discussed above with respect to the 642 patent, the details of which need not be repeated. Roku contends that Mishra “discloses that a set-top-box (system 12) sends key codes to a remote control (Mishra’s RCU 18), which saves those key codes for later use in controlling home theater devices.” RIB at 52, *citing* JX-0316 (Mishra) at ¶ 38; Tr. (Russ) at 878:8-16.

3. HDMI 1.3a

HDMI 1.3a is prior art under at least pre-AIA 35 U.S.C. §§ 102(a) and 102(b) because it was published and known on November 10, 2006, more than one year prior to October 28, 2011. RX-1077 (HDMI 1.3a) at 1. The evidence showing that it was published and known includes evidence that it was available for download on the Internet, without confidentiality restrictions, and that those working in the field were aware of its availability and contents. *See* Tr. (Venuti) at 618:16-619:22, 623:11-625:4, 626:7-627:7; RX-1103 (Venuti Decl.) at RX-1103.0001-0007, RX-1103.0287-0288; Tr. (Russ) at 879:7-15, 886:3-14.

HDMI 1.3a discloses an interface and cable for transmitting audiovisual signals among various devices in a home theater, including a CEC line for sending control and status information. RX-1077 (HDMI 1.3a) at RX-1077.0017, .0023-0024; Tr. (Russ) at 879:16-880:6. HDMI sources (i.e., devices sending A/V content) can determine the identity and characteristics of an HDMI display by reading its EDID (Extended Display Identification Data Standard (EDID)), which happens “at the moment of attachment” when the devices are physically connected pursuant to HDMI’s “Hot Plug Detect” protocol. RX-1077 (HDMI 1.3a) at RX-1077.0024-25, 0067, .0128, .0134 (“A Source shall read the EDID ... to determine the capabilities supported by the Sink”); Tr. (Russ) at 922:16-18, 969:9-21. When an HDMI source sends a message to another device which is acknowledged and does not result in a “feature abort,” the HDMI source assumes the message has been “correctly received” and “acted upon.” RX-1077 (HDMI 1.3a) at RX-1077.0192; Tr. (Russ) at 921:2-17, 886:21-887:3.

4. Combination of Chardon, Mishra, and HDMI 1.3a

Chardon discloses, among many other embodiments, a “multi-media gateway” (i.e., “first media device”) that includes a “processor” (i.e., “processing device”), “transceivers,” a “memory” (i.e., “memory device”), and a “CEC bus” (i.e., HDMI “port”). JX-0005 (196 patent) at cl. 1; RX-

0488 (Chardon) at ¶¶ 38, 40, Fig. 2. The transceivers, memory, and CEC bus are all “coupled” to the processor, CEC command codes are “communicated” over the CEC bus to “HDMI appliances” (i.e., the HDMI “port” is “for communicatively connecting the first media device to [] second media device[s]”), and the memory “may be configured to store computer code” (i.e., the “memory device . . . ha[s] stored thereon processor executable instruction[s]”), include code for a “remote-control engine.” JX-0005 (196 patent) at cl. 1; RX-0488 (Chardon) at ¶¶ 39, 40, Fig. 2. This embodiment, although it is called a “remote-control system,” does not include a “remote control device”; Chardon teaches other embodiments comprising a remote control device, however. RX-0488 (Chardon) at ¶¶ 38, 43.

As relevant to the 196 patent, Mishra discloses a “system” (i.e., “first media device”), a “remote control unit,” or RCU (i.e., “remote control device”), and a controlled or target “device” (i.e., “second media device”), where the system transmits IR codes to the RCU for relaying to the target device. JX-0005 (196 patent) at cl. 1; RX-0316 (Mishra) at ¶ 20. Roku contends that “Chardon does not explicitly teach that IR codes are sent from a [first] media device to configure a remote control to control [second media] devices,” and that Mishra fills this gap. RIB at 50.

a. Limitation 1(c) – “a transmitter, coupled to the processing device, for communicatively coupling the first media device to a remote control device”

UEI’s first argument against obviousness is framed as pertaining to limitation 1(c), relating to the “transmitter,” but in fact it relates to other elements of claim 1, as well. In summary, UEI contends that Chardon does not disclose either the multi-media gateway sending communications to the remote, or the remote control sending communications directly to the target device. *See* CIB at 69. In other words, UEI asserts, although Chardon discloses that the multi-media gateway has a transceiver, there is no teaching that the transceiver is used to communicate with the remote control, and that because of this, and the lack of disclosure of programming the remote control (a

lack Roku apparently relies on Mishra to remedy), Chardon offers no reason or motivation to send communications from the multi-media gateway to the remote control. *See id.*

Roku identifies Chardon's "multi-media gateway 110" as either the claimed "first media device" or "second media device," the "various HDMI appliances 105" as the claimed "second media device[s]," and the "remote control device 115" as the claimed "remote control device." CIB at 50; CRB at 28; RX-0488 (Chardon) at ¶¶ 29-31, Fig. 1. Again, Chardon discloses an embodiment of a "remote-control system" that is "included in . . . the multi-media gateway" and that comprises both IR and RF transceivers, but that embodiment does not include a separate remote control device or unit, and the transceivers transmit and receive signals between the multi-media gateway and HDMI appliances, not between the multi-media gateway and a remote control device. *See* RX-0488 (Chardon) at ¶¶ 38, 40. And although Chardon does disclose two embodiments where the remote control device "may be configured to transmit and receive in IR, RF, etc.," in one embodiment all the claimed hardware is incorporated into the remote control rather than the multi-media gateway, and in the other the "first media device" is an "HDMI display" rather than the multi-media gateway. *See id.* at ¶¶ 43, 44. Roku fails to identify any teaching in Chardon of "a transmitter" – as opposed to a receiver or transceiver – "for communicatively coupling the first media device" – i.e., the multi-media gateway – "to a remote control device" and with all the claimed hardware components configured as required by claim 1 of the 196 patent. *See* CRB at 28; JX-0005 (196 patent) at cl. 1. So inasmuch as the "transmitter" requirement is satisfied by the transceiver, the "communicative[] coupling" is not achieved by transmission; and inasmuch as the "communicative[] coupling" requirement is satisfied by reception, it does not involve the transceiver acting as a "transmitter." In short, this element is not taught by Chardon.

To be sure, Chardon does disclose the remote control device communicating directly with a “first HDMI appliance.” *See* RX-0488 (Chardon) at ¶ 62. But that appliance is not a target device; in fact, it plays the role of first media device normally played by the multi-media gateway. *See id.* (“the first HDMI appliance receiving the set of IR command codes [from the remote control device] may transmit a set of CEC command code[s] to a second HDMI appliance”). And the other embodiment cited by Roku as disclosing direct communication between the remote control device and a target device does not, in fact, include a remote control device. *See* CRB at 28, *citing* RX-0488 (Chardon) at ¶ 40. So UEI is correct that there is no reason in Chardon for the multi-media gateway/first media device to transmit to the remote control device, because the remote control device directly controls the multi-media gateway rather than any target device. *E.g.*, RX-0488 (Chardon) at ¶ 5 (describing the need for “embedded” remote control systems).

- b. Limitation 1(e) – wherein the instructions, when executed by the processing device, cause the first media device to be configured to transmit a first command directly to the second media device, via use of the high-definition multimedia communications port, to control an operational function of the second media device when a first data provided to the first media device indicates that the second media device when the first data provided to the first media device indicates that the second media device will be responsive to the first command, and cause the first media device to be configured to transmit a second data to a remote control device, via use of the transmitter, for use in configuring the remote control device to transmit a second command directly to the second media device, via use of a communicative connection between the remote control device and the second media device, to control the operational function of the second media device when the first data provided to the first media device indicates that the second media device will be unresponsive to the first command.**

Chardon discloses an embodiment where the remote-control engine, implemented on the multi-media gateway, sends “a CEC command code to an HDMI appliance” and the HDMI appliance responds. RX-0488 (Chardon) at ¶ 58, Fig. 5. It also discloses an embodiment where

the multi-media gateway queries the “HDMI display” for certain identification information, and the multi-media gateway is thereafter “configured” to link the identification to IR or CEC command codes for the HDMI display. *Id.* at ¶ 44.

UEI argues that because the multi-media gateway is configured by default to control the HDMI appliance by CEC, there is no further configuration of the multi-media gateway after the response or identification information (i.e., the “first data”) is received. *See* CIB at 70; CRB at 29 (the response is the “first data” for “subsequent commands”). Although there does not appear to be an express disclosure that the remote control engine thereafter causes the multi-media gateway to be configured to transmit a first command if the HDMI appliance responds positively, it stands to reason that the remote control engine would cause the multi-media device to continue to control the HDMI appliance using CEC/HDMI, as Dr. Russ testified. *See* Tr. (Russ) at 899:20-900:20; *see also* RX-0488 (Chardon) at ¶ 59 (“the method described above with respect to Fig. 5 is executed if the remote control engine has ‘response’ information that indicates that the HDMI appliance” will respond to CEC command codes). And any such command from the remote control engine would seemingly qualify as “configur[ing]” the multi-media gateway “to transmit a first command,” because it can include “storing in memory pass information for the CEC command code.” JX-0005 (196 patent) at cl. 1; RX-0488 (Chardon) at ¶ 14; *see* Tr. (Russ) at 928:4-929:8.

So Chardon teaches the first half of the “wherein” clause. As to the second half, Chardon teaches that the multi-media gateway sends the IR codes directly to the second media device. JX-0488 (Chardon) at ¶¶ 38-40. Chardon fails to teach or suggest “transmitting a second data to a remote control device, via use of the transmitter, for use in configuring the remote control device to transmit a second command directly to the second media device.” JX-0005 (196 patent) at cl.

1. Roku submits that Mishra teaches this feature, and one skilled in the art would be motivated to combine these references.

Specifically, Roku states that “Mishra’s system 12 is an intermediating device configured to send IR ‘codes’ and ‘protocols’ (*i.e.*, ‘second data’) to Mishra’s remote control (RCU 18) via path 24 (*i.e.*, a ‘communicative connection’).” RIB at 67 (referring to JX-0316 (Mishra) at ¶¶ 20, 33, Fig. 1). Mishra teaches that system 12 (*i.e.*, “first media device”) transmits control codes and protocols to remote control 18 (*i.e.*, “remote control device”), either all at once or on an as-needed basis, so that when the user presses a button, the remote control either interrogates the system to obtain the needed codes and protocols, or “fetch[es] the necessary codes from local memory and send[s] a unidirectional infrared message ... using the protocol that is also stored locally on the RCU.” JX-0316 (Mishra) ¶¶ 37-39; Tr. (Russ) at 938:10-939:20. Thus, Roku asserts that Mishra’s “system 12 transmits second data (IR key codes and protocols) to a remote control device (Mishra’s RCU 18) for use in configuring it to transmit commands (*i.e.*, IR messages) directly to another device.” RIB at 67. Additionally, as Roku notes in connection with dependent claim 11, Mishra discloses an RF transmitter coupled (via some intervening components) to a chipset (*i.e.*, “processing device”) for communicatively coupling the system (*i.e.*, “first media device”) to a remote control device. *See* JX-0316 (Mishra) at ¶¶ 49-52; JX-0005 (196 patent) at cls. 1, 11.

c. The Scope and Content of the Prior Art, the Level of Ordinary Skill in the Art, and the Differences Between the Prior Art and the Claimed Invention

All the limitations of claim 1 of the 196 patent can be found in Chardon and Mishra, although a certain amount of cherry-picking is required to do so, because Chardon and Mishra teach rather different processes. For instance, Chardon’s remote control only works as such when it has all the hardware recited in claim 1 of the 196 patent, whereas Mishra’s remote control works as such all the time. *See* Tr. (Rosenberg) at 1239:1-6. In fact, Chardon’s disclosed embodiments

either do not include a multi-media gateway (RX-0488 (Chardon) at ¶ 12), or do not include a remote control (RX-0488 (Chardon) at ¶¶ 40, 49, 68), or there can optionally be one but not the other (RX-0488 (Chardon) at ¶¶ 44, 50, 51). As another example, Mishra does not discuss HDMI or CEC, both of which are central to Chardon. *See* Tr. (Russ) at 1012:10-16. Moreover, neither Chardon nor Mishra come close to disclosing all the limitations of claim 1 separately; Chardon comes closer, but Mishra is still needed to identify a transmitter with the necessary features, a remote control that receives second data from the first media device, and a remote control that may be configured to transmit a second command directly to a second media device.

So the differences between the claimed invention and the prior art are more substantial here than with either the 642 or 317 patents. Nonetheless, the scope and content of the prior art does encompass all the limitations of claim 1, and, as Dr. Russ implied, a skilled artisan would have been capable of adding the transmitter and remote control of Mishra to Chardon. *See* Tr. (Russ) at 940:5-942:3. And Dr. Russ opined that Chardon teaches an “IR blaster,” which has “problems,” so a person of ordinary skill would have known to solve those problems by using direct control with a remote. *Id.* at 941:7.

Admittedly, Chardon and Mishra are not especially analogous to the 196 patent, for the reasons explained by Dr. Rosenberg. *See id.* at 1233:22-1235:11. But they do not have to be directed to the exact same problem to be reasonably pertinent, nor do they need to be physically combinable. *See Orthopedic Equip. Co.*, 702 F.2d at 1013; Tr. (Rosenberg) at 1241:10-15 (“you wouldn’t need to have two units, one is enough”). Mishra states that its “invention relates generally to remotely controlling electronic devices.” JX-0316 (Mishra) at ¶ 1. Chardon’s invention “relate[s] to a remote-control system configured to operate on a variety of remote control platforms.” RX-0448 (Chardon) at ¶ 6. Moreover, both Mishra and the 196 patent seek to make

improvements to remote controls in a user friendly way. *See* JX-0316 (Mishra) at ¶ 5; JX-0005 (196 patent) at 2:4-5.

Therefore, on balance Roku has made out a prima facie case for obviousness as to claim 1 of the 196 patent in view of Chardon and Mishra.³

d. Secondary Considerations of Non-Obviousness

In sharp contrast to the 642 and 317 patents, the objective indicia of non-obviousness for the 196 patent are substantial; indeed, they are dispositive. UEI asserts essentially four items of evidence: (1) a Wall Street Journal article published in 2016, that is, between filing and issuance of the 196 patent; (2) a CNET article also published in 2016; (3) witness testimony by Dr. Rosenberg; and (4) witness testimony by Mr. Barnett, including certain documentation. *See* CIB at 76-78.

The evidence shows a long-felt but unmet need. Dr. Rosenberg testified that the “proliferation of devices,” operating over disparate communications methods, presented a problem, which the 196 patent solved specifically by “determining the best command control path for any given device to have reliable user-friendly operation.” Tr. (Rosenberg) at 1247:7-14. Admittedly, QuickSet by itself contributed to solving this problem, but determining the best command and control path, i.e., choosing between HDMI/CEC and IR, is specific to the 196 patent. *See* Tr. (Barnett) at 32:20-35:1; Tr. (Rosenberg) at 183:13-184:13 (describing the operation of QuickSet). The presence of a long-felt but unmet need is pithily summed up in the Wall Street Journal article: “Hallelujah! Samsung fixed the most annoying thing about TVs! It only took 30 years!” JX-0267 at 1.

³ Roku correctly asserts that HDMI 1.3a is “not necessary for the conclusion of obviousness.” RIB at 58. Its teachings therefore need not be addressed further.

[REDACTED]

The evidence shows praise by the industry. As noted, the Wall Street Journal praised the technical solution, and there is sufficient nexus to the 196 patent for such praise to be pertinent.

Specifically, the article states:

The first time I set up the TV, it probed all my devices via their HDMI cables. Newer gadgets . . . it knew right off the bat. For older ones, it asked me to identify a brand or a model number.

Behind the scenes, the TV was labeling each input and wirelessly teaching its remote the language of its corresponding device Some equipment uses infrared signals, while others communicate via HDMI or Wi-Fi. Samsung's TV and remote are your universal translator.

JX-0267 at 2. The article also has a diagram showing a Samsung TV ("first media device"), a remote control, and various controlled devices ("second media device[s]"), including an Apple TV. *Id.*; JX-0005 (196 patent) at claim 1. The CNET similarly praised the Samsung TVs, and similarly described the programming process: "[i]f the device works with HDMI-CEC . . . the TV can recognize that and control it accordingly, [thereby] operating the device via the HDMI connection." JX-0282 at 4. If HDMI does not work, "the TV . . . queries its database and programs the IR (infrared) commands of the TV remote automatically." *Id.*

The evidence shows widespread adoption. Dr. Rosenberg's testimony, where he agreed that "the '196 patent [is] used often in the QuickSet embodiments," is somewhat conclusory. *Tr.* (Rosenberg) at 1248:15-19. Mr. Barnett, however, summarized the process by which QuickSet operates with the Samsung DI Products: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] *See generally* *Tr.* (Barnett) at 55-59. UEI tracks Samsung's use of QuickSet

Cloud, which is a measure of “operations per year, just for Samsung customers,” and [REDACTED]
[REDACTED] See *id.* at 51:10-17; Tr. (Rosenberg) at 1248:15-19.

As to all three objective indicia asserted by UEI, there is a sufficient nexus to the 196 patent. The Wall Street Journal article, and even more so the CNET article, describe in general terms what is recognizably claim 1 of the 196 patent – but, significantly, not Chardon or Mishra – and even considering the various other features of QuickSet, Mr. Barnett’s explanation of how that software works is also recognizably claim 1 of the 196 patent. So Roku’s assertion that “UEI’s evidence falls far short of showing a nexus” is not persuasive. RIB at 73. Nor does Dr. Russ’ opinion undermine this conclusion. Chardon does not solve the same long-felt need as the 196 patent, because it does not teach the same type of interactions between a remote control and a first media device (*see* Tr. Russ at 964:23-966:12), nor does the fact that QuickSet “us[es] features of the HDMI standard” to control and query devices mean that the HDMI standard is capable of automatically configuring a remote control based on the claimed “first data” (*see id.* at 970:16-971:13). Dr. Russ’ opinion is otherwise conclusory (*e.g., id.* at 980:12-16) or inconsistent with the underlying fact evidence (*see* Tr. (Russ) at 967:5-20 (“one of the things that’s appealing about QuickSet” is its IR database); RX-0069C (Arling Depo.) at 134:8-13 (Q: Okay. But the ability to control the wide variety of devices through a complete IR database is at least one factor that’s relevant to your customer[s’] decisions, isn’t it? A: Well, unfortunately, it’s a small factor.)).

On balance, UEI’s evidence of secondary considerations of non-obviousness is impressive, so much so that it outweighs Roku’s marginal *prima facie* case of obviousness. Accordingly, and in view of all of the Graham factors, Roku has not proven that claim 1 of the 196 patent is obvious.

e. The Dependent Claims

Roku does not assert that claim 2, which is practiced by the Samsung DI Products, is invalid. Instead, its obviousness arguments for the dependent claims pertain only to those claims relating to infringement.

Claim 3 – The first media device as recited in claim 1, wherein the second media device comprises a media sink device for the first media device acting as a media source device and wherein the first media device transmits media data to the media sink device via use of the high definition multimedia interface communications port.

Chardon discloses the multi-media gateway receiving a “media stream” from a source, and then transferring “the media stream to an HDMI display or the like for play thereon.” RX-0488 (Chardon) at ¶ 74. UEI does not separately dispute this point, but rather argues that since the combination of Chardon, Mishra, and HDMI 1.3a does not render Claim 1 obvious, it does not render Claim 3 obvious. CIB at 74.

Claim 11 – The first media device as recited in claim 1, wherein the transmitter comprises a radio frequency (RF) transmitter.

UEI first argues that since the combination of Chardon, Mishra, and HDMI 1.3a does not render Claim 1 obvious, it does not render Claim 11 obvious. CIB at 74. UEI also argues that “[a]s none of the prior art relied upon by Roku discloses using an RF transmitter to communicate data to the alleged remote control via RF Claim 11 is not rendered obvious.” CRB at 41. This is incorrect. As noted, Mishra discloses that its “system 12” includes an RF transceiver for transmitting to a remote control. JX-0316 (Mishra) at ¶ 52, Fig. 7.

Claim 13 – The first media device as recited in claim 1, wherein the first data provided to the first media device comprises data indicative of a success status of a test command that was transmitted to the second media device.

Claim 14 – The first media device as recited in claim 13, wherein the test command is transmitted to the second media device by the first media device via use of the high-definition multimedia interface communications port.

Claims 13 and 14 are considered together because the same disclosures in Chardon are relevant to both claims. Namely, Chardon discloses “transmitting a CEC command code to an HDMI appliance via an HDMI cable,” and “if a response is issued from the second HDMI appliance, then storing in memory pass information for the CEC command code.” RX-0488 (Chardon) at ¶¶ 14, 58. UEI argues that since the combination of Chardon, Mishra, and HDMI 1.3a does not render Claim 1 obvious, it does not render Claims 13 or 14 obvious. CIB at 75-76. UEI also argues that CEC commands do not alone qualify as test commands, because then every single CEC command would be a test command. *See id.* But that is what the 196 patent teaches: “[s]uch testing may take the form of . . . monitoring of HDMI interface status changes.” JX-0005 (196 patent) at 9:46-49; *see* Tr. (Russ) at 1013:15-21.

Claim 15 – The first media device as recited in claim 13, wherein the test command comprises a command transmitted to test a volume functional operation of the second media device.

Chardon discloses that every CEC command is monitored for a response, and that such monitored CEC commands can include volume control: “other states . . . may be monitored by the remote-control engine such as . . . the volume state.” RX-0488 (Chardon) at ¶ 66. UEI argues only that since “the combination of Chardon, Mishra, and HDMI 1.3a does not render Claims 1 and 13 obvious, it does not render Claim 15 obvious.” CIB at 76.

f. Discussion

The additional features of the various dependent claims are all disclosed in either Chardon or Mishra, so as with claim 1, the scope and content of the prior art weighs in favor of obviousness. However independent claim 1 is not found to be obvious in view of secondary considerations. Thus, its dependent claims, 3, 11, 13, 14, and 15 (the latter two depending from dependent claim 13) also are not found to be obvious. *See Ortho-McNeil Pharm., Inc. v. Mylan Labs., Inc.*, 520 F.3d 1358, 1365 (Fed. Cir. 2008) (“But if claim 1 is not obvious [based on secondary

considerations] then claims 6–8 also cannot be obvious because they all depend from a nonobvious claim.”); *In re Fritch*, 972 F.2d 1260, 1266 (Fed.Cir.1992) (“[D]ependent claims are nonobvious if the independent claims from which they depend are nonobvious.”).

VII. DOMESTIC INDUSTRY - ECONOMIC PRONG

In a patent-based complaint, a violation of Section 337 can be found “only if an industry in the United States, relating to the articles protected by the patent ... concerned, exists or is in the process of being established.” 19 U.S.C. § 1337(a)(2). Under Commission precedent, this “domestic industry requirement” of Section 337 consists of an economic prong and a technical prong. *Stringed Instruments*, Inv. No. 337-TA-586, Comm’n Op. at 12-14. The complainant bears the burden of establishing that the domestic industry requirement is satisfied. *See Certain Set-Top Boxes and Components Thereof*, Inv. No. 337-TA-454, Initial Determination at 294 (June 21, 2002) (not reviewed in relevant part).

The economic prong of the domestic industry requirement is defined in subsection (a)(3) of Section 337 as follows:

(3) For purposes of paragraph (2), an industry in the United States shall be considered to exist if there is in the United States, with respect to the articles protected by the patent, copyright, trademark or mask work concerned --

(A) Significant investment in plant and equipment;

(B) Significant employment of labor or capital; or

(C) Substantial investment in its exploitation, including engineering, research and development, or licensing.

19 U.S.C. § 1337(a)(3). The economic prong of the domestic industry requirement is satisfied by meeting the criteria of any one of the three factors listed above. The Commission has clarified that investments in plant and equipment, labor, and capital that may fairly be considered investments in research and development are eligible for consideration under subsections (A) and

(B), in addition to subsection (C). *See Certain Solid State Storage Drives, Stacked Electronics Components, and Products Containing Same*, Inv. No. 337-TA-1097, Comm’n Op. at 14 (June 29, 2018) (“*Solid State Storage*”).

UEI contends that its domestic investments “focus largely on the significant and substantial investments of its U.S. employees in developing, maintaining, and supporting various aspects of Quickset.” CIB at 129. UEI asserts that for the 196 and 317 patents, it relies on the investments in the QuickSet Platform and Samsung DI Products QuickSet integrations, and for the 642 patent, it relies on the design and development of the UEI DI Products and the UE 878 microcontroller contained in the remotes. *Id.* As discussed above, the technical prong of domestic industry was shown to exist for all three patents as of the filing of the complaint, although the claims practiced by domestic industry for the 642 and 317 patents have been proven invalid.

A. Domestic Industry Investments

1. UEI Quickset Platform (SDK + Cloud) Investments

UEI states that the QuickSet Platform is “central to the enablement and embodiment of the exploitation of the technology in the 196 and 317 Patents.” CIB at 130. The QuickSet Platform is comprised of two primary elements: the QuickSet Software Development Kit (“QuickSet SDK”) and the QuickSet Cloud. *See* Tr. (Barnett) at 39:16-19; CDX-0078C.7. QuickSet SDK is the software development kit, which is software provided to and installed onto the Samsung DI Products (among others), to implement QuickSet on end-user devices and for end users to use QuickSet technology on those devices. *See* Tr. (Barnett) at 40:3-19. According to Mr. Barnett, QuickSet SDK undergoes successive development, where each new version is based on the previous version and adds “features, enhancements, [and] optimizations.” Tr. (Barnett) at 47:18-48:16.

UEI explains that its QuickSet Cloud is a cloud-based portion of QuickSet, including an online database and a series of enhanced functionality beyond the SDK, which “does the work in figuring out what devices are located in the home theater, essentially through receiving the digital signature fingerprint from the QuickSet SDK.” CIB at 130, *citing* Tr. (Barnett) at 40:20-41:7. UEI further states that the Samsung DI Products [REDACTED] of times a year as they function to support the QuickSet implementation on those TVs, [REDACTED]

[REDACTED] *Id.*, *citing* Tr. (Barnett) at 51:4-17. Both the QuickSet SDK and Cloud are necessary for Samsung’s implementation and use of QuickSet in the Samsung DI Products. *See* Tr. (Barnett) at 41:8-42:14.

UEI tracks the costs of its engineering and R&D investments by project code, in the ordinary course of business, through UEI’s record keeping software called “KeyedIn.” *See, e.g.*, Tr. (Barnett) at 43:17-25, 45:7-47:3. The information includes the labor costs tracked on a project by project basis. *See id.* at 96:8-97:1.

To determine the labor costs for this investigation, UEI selected “projects that only relate to QuickSet SDK and Cloud.” CIB at 131. [REDACTED]

[REDACTED] *See* Tr. (Barnett) at 47:6-17 (identifying SDK projects shown in CDX-0078C.11); 49:24-50:13 (identifying QS Cloud projects in CDX-0078C.12); JX-0431C (containing SDK investments)). However, UEI is not relying on version 4.0 through 4.6 to establish its domestic industry. CRB at 68.

[REDACTED] *See* Tr. (Barnett) at 49:24-50:13 (identifying QuickSet Cloud projects in CDX-0078C.12); JX-0431C (database containing investment figures

for said projects)). Although Samsung had not yet finished implementing some Cloud projects at the time of the complaint, those features “were nonetheless provided and available to Samsung for use at that time.” CIB at 131-132, *citing* Tr. (Barnett) at 50:8-25, 93:21-95:14. Mr. Barnett explained this delay between delivery and implementation as the way Samsung integrates software into the Samsung DI Products: “Samsung “need[s] all the software well in advance that can be integrated and tested. It goes through their own QA cycle. They need lots of lead time.” Tr. (Barnett) at 95:2-5). The Samsung DI Products presently use all of the features provided by these Cloud projects. *See* Tr. (Barnett) at 50:23-25.

2. Samsung Customer QuickSet Integration Investments

In addition to investments in the QuickSet Platform, UEI states that it invests in R&D projects “dedicated to implementing and integrating QuickSet on Samsung DI Products specifically, [and] tracks the Samsung DI Products integration investments by project code in the ordinary course of business in its KeyedIn database.” CIB at 132, *citing* Tr. (Barnett) at 60:15-61:4. Mr. Barnett explained that these projects involve the integration of QuickSet implementations on the Samsung DI Products. *See* Tr. (Barnett) at 60:15-61:23; CDX-0078C.13. From 2012 to March 2020, UEI invested [REDACTED] in domestic R&D labor for these projects. *See* Tr. (Barnett) at 61:5-23; CDX-0078C.13.

3. UEI DI Products (Remotes) Investments

UEI designs and develops remote controls for use in QuickSet for customers such as Dish Network, Netflix, AT&T, and Verizon. *See* Tr. (Barnett) at 64:15-19; Tr. (Prouse) at 265:25-266:6; CDX-0078C.14-.19. UEI selected representative remote controls (the “UEI DI Products”) as representative of UEI’s domestic industry in the 642 patent with respect to Claim 19. *See* CIB at 132. These UEI DI Products were all designed and developed primarily in the United States by

UEI employees. *See* Tr. (Barnett) at 65:6-20. UEI also developed the UE878 microcontroller for use in smart remotes, including the UEI DI Products. *See* Tr. (Barnett) at 66:5-12.

UEI tracks the UEI DI Products and UE878 chip R&D investments in the ordinary course of business in its KeyedIn program. *See* Tr. (Barnett) at 65:6-20, 66:5-12. From 2016 through March 2020, UEI invested [REDACTED] in U.S. labor investments in the UEI DI Products and an additional [REDACTED] in the UE878 microcontroller. *See* CX-1321C; CX-1322C.

4. Roku's Objections

Roku advances several criticisms of UEI's economic prong case, other than significance and substantiality, which are addressed below. First, Roku argues that UEI fails to properly allocate its investments related to, and includes investments unrelated to, the Samsung DI Products. *See* RIB at 126-32. Roku asserts that "the indisputable fact is that the QuickSet Platform contains a wide range of features—many of which are not used on the Samsung DI Products—and there are significant factual questions as to which projects resulted in features actually implemented in the Samsung DI Products." RIB at 127, *citing* Tr. (Vander Veen) 1060:20-1062:6; RDX-0010C.9-10 (Vander Veen demonstratives); Tr. (Lipoff) 562:19-566:5, (Balakrishnan) 745:3-747:15.

But Mr. Barnett testified that for its domestic industry UEI selected QuickSet projects that are "necessary" for the functioning of Samsung DI Products. Tr. (Barnett) at 48:17-49:1, 50:14-18, 61:20-23. Moreover, Dr. Prowse testified that UEI only counted QuickSet investments that related to either "QuickSet SDK Cloud or specifically to Samsung." Tr. (Prowse) at 450:16-18. Thus, UEI did not include "hundreds of QuickSet projects specific to other customers or in products not at issue, such as Nevo Butler." CIB at 134, *citing* Tr. (Prowse) at 449:12-450:18; CDX-4C.22-26. Dr. Prowse further testified that he counted only investments in the QuickSet SDK for Samsung DI Products up to the version (3.9) at the time of the Complaint. *See* Tr.

[REDACTED]

(Prowse) at 247:9-20. Finally, Dr. Prowse testified that for prong B he allocated the QuickSet Platform investments by generating a ratio of Samsung DI Products-specific investments to all customer-specific investments. *See* Tr. (Prowse) at 402:19-405:20; Tr. (Barnett) at 63:15-18. And the more a customer uses QuickSet, the more they use and rely upon the QuickSet Platform (*id.*)” CIB at 134. Thus, UEI asserts that based on this analysis, “Samsung comprised [REDACTED] of all customer-specific investments from 2014 to 2019.” CIB at 134, *citing* Tr. (Prowse) at 403:8-405:7.

Roku further argues that UEI inappropriately included investments relating to recently developed technology not actually implemented in the Samsung DI Products. *See* RIB at 126. Specifically, Roku states that UEI claims investments related to the “QuickSet Cloud – Predictive Discovery Engine” (project number 30167), which was not in products shipped at the time of the filing of the complaint. *See* RIB at 127-128, *citing* Tr. (Barnett) 85:22-7.

But “Commission precedent is clear in stating that any activities or investments prior to the filing of the complaint are relevant to showing that a domestic industry exists or is in the process of being established, regardless of whether the product has been sold prior to filing.” *Certain Electronic Devices*, Inv. No. 337-TA-847, Order No. 18, at 4 (May 28, 2013) (denying motion *in limine* to exclude investments related to products not yet released at the time of the complaint)). While a domestic industry must be measured at the time of the complaint, that does not mean that investments made prior to filing in future to-be released products do not count. *See id.* Moreover, CX-1320C shows that project number 30167 investment was [REDACTED] which even if disregarded has little effect on the finding that UEI has a domestic industry.

Roku also argues that UEI inappropriately included total investments over the past eight years, which include investments that were made before the March 2020 issuance of the 196 and

317 patents. RIB at 126. But the priority dates of the 196 and 317 patents are October 28, 2011 and September 8, 2005, respectively, and an invention can be commercialized during the pendency of a patent application. *See* CRB at 72.

Roku argues that the Samsung DI Products incorporate only QuickSet SDK version 3.4 and the RF4CE feature of version 3.9. RIB at 132. But Mr. Barnett testified that each version of QuickSet was built on the previous version, and thus, by definition the Samsung DI Products incorporated the older version of QuickSet:

Q . . .What does it mean to have the next version of QuickSet? What are those developments, 1 when you determine that it's a new version of QuickSet?

A. A new version is developed based on the previous versions. So we take the previous released version, we add features, enhancements, optimizations to that to create the new follow-on release.

Q. So, again, QuickSet version 3.8, does that build on all of your efforts in 3.7?

A. Yes, it does.

Q. And all of your efforts in 2.7?

A. Yes.

Q. All of your efforts in 2.1?

A. That's correct.

Q. Are there any of these QuickSet projects where you decided we're just going to develop QuickSet all over again from scratch?

A. No.

Tr. (Barnett) at 47:24-48:16. Thus, the previous project versions were necessarily part of the Samsung DI Products' implementation of QuickSet, and appropriately utilized in the domestic industry calculation.

Roku also argues that "UEI's overexpansive view of its domestic industry also masks the declining trend in UEI's asserted investments and artificially inflates the level of its investments

[REDACTED]

at the time of the filing of the Complaint.” RIB at 133, *citing* Tr. (Vander Veen) 1068:10-1069:12; RDX-0010C.12 (Vander Veen demonstrative). Roku argues that “projects are not ongoing investments and many of these project investments ended several years ago,” and thus, at the time the complaint was filed UEI’s domestic industry activities were minimal. RIB at 133. But UEI continues to invest in the QuickSet implementation on Samsung DI Products, as even Roku’s expert acknowledges. *See* Tr. (Vander Veen) at 1095:10-1096:2 (“I don’t believe that investments in QuickSet related to Samsung are being discontinued.”).

Moreover, Dr. Prowse demonstrated that UEI spent [REDACTED] [REDACTED] on implementations for the Samsung DI Products. *See* Tr. (Prowse) at 262:4-263:13. This is shown below, based on CX-1320C:



The Commission has stated that nothing requires that a “complainant’s domestic industry investment at the time of the filing of the complaint be increasing compared to past years.” *Certain Marine Sonar Devices*, Inv. No. 337-TA-921, Comm’n Op. at 63 (Dec. 1, 2015). All a complainant

needs to show is that there are past expenditures and that it is “continuing to make qualifying investments at the time the complaint is filed.” *Certain Television Sets*, Inv. No. 337-TA-910, Comm’n Op. at 68 (Oct. 30, 2015). UEI has done this.

UEI’s summary of its domestic industry bases in the QuickSet Platform, QuickSet Samsung Integration, and UEI DI Products (remotes + chips), is provided below:



JX-0431C; JX-0432C; JX-0433C; CDX78C.11-13; and Tr. (Barnett) at 65:6-20, 66:912.

B. Significant Employment of Labor or Capital under Prong B

1. “Significant” or “Substantial”

The next step in the evaluation of domestic industry is to determine if the investment amounts identified above are “significant,” as in subsections (A) (which is not asserted by UEI) and (B), or “substantial,” as in subsection (C). The most recent precedential decision by the Court of Appeals for the Federal Circuit addressing this determination is *Lelo*, which restated law applicable to a number of issues surrounding the economic prong of domestic industry. *See Lelo Inc. v. ITC*, 786 F.3d 879, 883-85 (Fed. Cir. 2015). In particular, the Federal Circuit held that the statutory terms “‘significant’ and ‘substantial’ refer to an increase in quantity, or to a benchmark

⁴ As discussed, this investment will not be used in calculating UEI’s investments in DI Products.

in numbers,” and “[a]n ‘investment in plant and equipment’ therefore is characterized quantitatively, *i.e.*, by the amount of money invested in the plant and equipment.” *Lelo*, 786 F.3d at 883. Continuing, the Federal Circuit held “[a]ll of the foregoing requires a quantitative analysis in order to determine whether there is a ‘significant’ increase or attribution by virtue of the claimant’s asserted commercial activity in the United States.” *Id.* In short, “[q]ualitative factors cannot compensate for quantitative data that indicate insignificant investment and employment.” *Id.* at 885. The Commission has since made clear that some sort of comparative analysis must be made before significant or substantial can be found. *See, e.g., Certain Gas Spring Nailer Products and Components Thereof*, Inv. No. 337-TA-1082, Notice of Comm’n Determination at 3 (Dec. 12, 2019); *Certain Carburetors and Products Containing Such Carburetors*, Inv. No. 337-TA-1123, Comm’n Op. at 17-19 (Oct. 28, 2019).

2. The 196 and 317 Patents

Considering subsection (B), “significant employment of labor or capital,” UEI states that it has a significant domestic employment of labor or capital in the Samsung DI Products that practice the 196 and 317 patents through its investments in R&D labor in (1) QuickSet Platform (allocated to Samsung) and (2) Samsung DI Products-specific QuickSet integration projects. *See* CIB at 133. Based on Dr. Prowse’s analysis, Samsung comprised [REDACTED] of all customer-specific investments from 2014 to 2019. *See* Tr. (Prowse) at 403:8-405:7. UEI submits that this number is “a conservative, reasonable allocation as it was substantially less than a ‘sales-based’ allocation [REDACTED] would be using QuickSet royalties.” CIB at 134, *citing* Tr. (Prowse) at 405:17-406:3. Dr. Prowse calculated [REDACTED] in R&D labor allocated to the Samsung DI Products practicing the 196 and 317 patents at the time of the complaint, based in part on the testimony of Mr. Barnett and

Mr. Barnett's spreadsheets. *See* Tr. (Prowse) at 406:18-407:9. As noted above, these figures are sufficiently reliable to evaluate for significance under subsection (B).

Quantitatively, [REDACTED]

[REDACTED] *See* Tr. (Prowse) at 257:21-258:23, 408:22-409:25.

Moreover, [REDACTED]

[REDACTED] *See* Tr. (Prowse) at 258:24- 259:15; *see generally* JX-0431C.

Qualitatively, "without the investment, the Samsung TVs wouldn't practice the patent[s]." Tr. (Prowse) at 259:16-260:11. As Mr. Barnett put it, QuickSet is "necessary" for the Samsung TVs to practice the asserted patent claims. Tr. (Barnett) at 48:17-49:1, 50:14-18.

Roku argues that UEI did not show that its QuickSet investments are significant in comparison to the Samsung DI Products, "which are complex and expensive consumer electronic devices," and the "features QuickSet purportedly enables are only a small part of the Samsung DI Products." RIB at 135, *citing* Tr. (Lipoff) 562:19-566:11; (Balakrishnan) 746:2-13; (Prowse) 440:25-441:4. Roku cites no precedent for this argument, and there is no clear relevance to the fact that the patented article (a first media device comprising a few hardware components and implementing QuickSet software) is incorporated into a larger apparatus.

Roku further argues that UEI's investments are not significant because "QuickSet may never be used in the Samsung DI Products," if, for example, an end user controls a connected device (*e.g.*, cable box or DVD player) with that device's dedicated remote and does not connect any other device to the Samsung DI Product (*e.g.*, uses a Samsung TV without a cable box). RIB at 135, *citing* Tr. (Lipoff) 565:4-566:5; (Balakrishnan) 747:5-15. This may be relevant for claim

2 of the 196 patent, which requires a second media device, but it is otherwise irrelevant; the Samsung DI Products practice claim 1 of the 196 patent, and the fact that a DI product need not be used for its intended purpose is neither here nor there.

Roku further argues that UEI fails to show significance because neither UEI nor Dr. Prowse compared UEI's domestic investments in QuickSet to any other investments in the Samsung DI Products, whether by Samsung or by another supplier of components or software. RIB at 135-136. Roku reasons that a "comparison is necessary to establish the significance or substantiality of UEI's investments, because the Samsung DI Products—not QuickSet—are the protected articles." *Id.* But the test for significance under prong B involves a comparative analysis of the complainant's labor and capital investments, not some other company's investments.

Lastly, Roku argues that QuickSet is not an article protected by the 317 and 196 patents. *See* RIB at 126, 131-32. That QuickSet is intangible is not dispositive, and Roku's reliance on *ClearCorrect Operating, LLC v. ITC*, 810 F.3d 1283 (Fed. Cir. 2015), is misplaced. In that case, the United States Court of Appeals for the Federal Circuit was not discussing what defines a domestic product, but rather whether "digital data that was transferred electronically, i.e., not digital data on a physical medium such as a compact disk or thumb drive" is an "article" as described in 19 U.S.C. § 1337(a). 810 F.3d at 1290, 1296. The court held that digital data alone, as opposed to "digital data on a physical medium," is not an article under the statute. *Id.* at 1300. This holding simply is not relevant here. Nor is the fact that QuickSet alone fails to practice all the elements of any claim of the 317 and 196 patents, because the Samsung DI Products do practice the claims when implementing QuickSet, and the Samsung DI Products are licensed. *See Certain Multi-Stage Fuel Vapor Canister Systems and Activated Carbon Components Thereof*, 337-TA-

1140, Initial Determination at 116-17 (Jan. 28, 2020) (“*Multi-Stage Fuel Vapor Canister Systems*”).

Overall, UEI’s comparison of the number of UEI R&D employees performing activities related to the Samsung DI Products with the total number of UEI QuickSet R&D employees, and the [REDACTED]

[REDACTED] See Tr. (Prowse) at 257:21-259:15. Accordingly, UEI has made significant investment in labor and capital under prong B for the 196 and 317 patents.

3. Remote Control Investments for the 642 Patent

UEI asserts that it has demonstrated a significant employment of labor or capital under prong B for the 642 patent through its domestic investments in R&D labor in the design and development of the UEI DI Products. See CIB at 135-36. Quantitatively, Dr. Prowse calculated [REDACTED] dollars in domestic R&D labor from 2016 through March 2020 for prong B. See Tr. (Prowse) at 410:1-21; JX-0432C. Qualitatively, all the investments in question go to the critical activities in the design and development of virtually every aspect of the UEI DI Products. See Tr. (Barnett) at 64:15-19; Tr. (Prowse) at Tr. 266:7-17.

Roku asserts that UEI has failed to show that these investments are significant in the context of its overall business because the “asserted item numbers comprised between [REDACTED] of UEI’s originally claimed revenues related to its Asserted Domestic Industry Remote Products between 2017-2019.” RIB at 138. And, over this same time period, this represents [REDACTED] of UEI’s total asserted revenues.” *Id.* Furthermore, Roku asserts that the UEI DI Products make up a small fraction of UEI’s remote control business overall. *Id.* at 139, *citing* RX-0641C (UEI remote revenue). Moreover, UEI manufactures all of its remotes in foreign countries, but it

did not “provide a comparison between the alleged domestic investments and manufacturing labor investments abroad—even as to the particular UEI DI Products at issue here.” *Id.*, citing Tr. (Prowse) at 444:16-22.

Considering foreign manufacturing costs is not the only factor the Commission examines in evaluating a complainant’s economic prong calculations. “Commission precedent permits complainants to present evidence of their U.S. investments using methods and approaches that are appropriate to the facts of a particular investigation.” *Certain Movable Barriers*, Inv. No. 337-TA-1118, Comm’n Op. at 23-26 (Jan. 12, 2021). “Thus, while foreign manufacturing costs may be relevant to proving that a complainant’s investments are significant or substantial, [Respondent] has provided no authority that compels a finding that domestic investments cannot satisfy the domestic industry requirement in the absence of presenting a comparison of foreign manufacturing costs to a complainant’s U.S. investments.” *Id.* In *Certain Movable Barriers*, the Commission found that Complainant’s domestic labor and capital investments were “significant” because they supported “critical” and “foundational” engineering, R&D, and technical support for its DI products. *Id.* at 22. Similarly, in this case, UEI established that its R&D investments in its remotes go directly to the functionality necessary to practice the 642 patent, and thus, UEI met its burden to show that its domestic investments were “significant” under prong B.

B. Substantial Investments in the Exploitation of the Asserted Patents Under Prong C

1. The 196 and 317 Patents

UEI asserts that its investments in engineering and R&D labor are substantial under prong C. CIB at 136-137. UEI further asserts that “there is no need to allocate the engineering and R&D investments in the QuickSet Platform to the Samsung DI Products (e.g. Samsung TVs) because . . . all of the R&D investments [have] a strong and direct nexus to the claimed features of the Asserted

Patents.” *Id.*, citing *Certain Multi-Stage Fuel Vapor Canister Systems* at 218 (“The ‘nexus’ requirement for subsection (C) can be met through allocation to patent-practicing articles, but it is not necessary, as there is only a need to have a nexus to the asserted intellectual property.”).

Dr. Prowse summarized his analysis of UEI’s investments under prong C for the 196 and 317 patents:

CDX-4C.9, citing JX-0431C. Thus, UEI invested approximately [REDACTED] in domestic engineering and R&D for the 196 and 317 patents.

Dr. Rosenberg and Mr. Barnett explained the nexus between these investments and both the patents and the Samsung DI Products. *See* Tr. (Barnett) at 54:25-60:2 (discussing how QuickSet SDK and Cloud function on and with Samsung TVs), 40:3-19 (SDK is the software installed on Samsung TVs); Tr. (Rosenberg) at 163:4-169:24 (explaining how QuickSet SDK operates as software instructions for the 196 and 317 patents), 224:7-227:2 (same). They also explained how QuickSet Cloud provides the “control rule” for the Samsung DI Products to practice claim 1 of the 196 patent. *See* Tr. (Barnett) at 57:7-58:20 (explaining how control rules are developed by UEI, maintained on the cloud, and delivered and used by Samsung DI Products); Tr. (Rosenberg) at 167:18-23, 169:25-172:17 (explaining use of the control rule by Samsung DI Products in practicing the 196 patent). They further explained how QuickSet Cloud provides the command codes needed to practice claim 1 of the 317 patent. *See* Tr. (Barnett) at 57:3-15 (explaining how Quickset Cloud provides the specific code set information); Tr. (Rosenberg) at

CONFIDENTIAL MATERIAL OMITTED

168:21-169:24, 175:18-25, 183:13-184:13 (discussing use of code sets in Samsung DI Products to meet claim 1 of the 317 patent). And investments in QuickSet Samsung integration projects go directly to the integration of the QuickSet platform onto the Samsung DI Products, thus enabling them to practice the 196 and 317 patents. *See* Tr. (Barnett) at 60:15-61:23.

Quantitatively, approximately two-thirds of UEI's engineering and R&D investments the QuickSet Platform and Samsung integration projects are carried out in the U.S.:



See Tr. (Prowse) at 257:21-258:23; CDX-0004C.9. Moreover, a substantial portion of

See Tr. (Prowse) at 258:24-259:15.

Quantitatively, as noted, UEI's investments go directly to the functionality necessary to practice many claimed elements of the 317 and 196 patents. *See* Tr. (Prowse) at 259:16-260:5. Furthermore, maintenance of the QuickSet Platform is necessary to promote and sustain the commercial viability of the Samsung DI Products. *See* Tr. (Barnett) at 61:20-23; Tr. (Prowse) at 248:4-9.

Such evidence is sufficient to establish nexus, because QuickSet involves software and “software updates” that result in practice of the asserted claims when implemented on the Samsung DI Products. *Certain Marine Sonar Devices* at 65. As in *Certain Marine Sonar Devices*, the “entirety of [Complainant’s asserted] expenditures is attributable to [its] domestic investment in research and development and engineering.” *Id.* at 64-66. And because “the complainant is engaged in substantial research and development involving the asserted patent[s]” – on average, over [REDACTED] per year between 2012 and 2020 – UEI’s evidence is also sufficient to establish substantiality. *Id.* at 65-66. Roku’s remaining criticisms regarding prong C are meritless. *See* RIB at 139-43.

Therefore, UEI has shown by a preponderance of evidence that it has satisfied prong C for the 196 and 317 patents.

2. The 642 Patent

UEI asserts that its investments in engineering and R&D related to the UEI DI Products and the UE878 chips are substantial. *See* CIB at 140-41. Quantitatively, [REDACTED] investment in R&D relating to the UEI DI Products and UE878 chip have taken place in the U.S. *See* Tr. (Prowse) at 398:22-399:19; CDX-4C.17. Qualitatively, there is a strong nexus between UEI’s investments and exploitation of claim 19 of the 642 patent, and the investments involved the actual design, development, and testing of the UEI DI Products and UE878 chip. *See* Tr. (Barnett) at 64:15-19; Tr. (Prowse) at 266:7-17, 399:20-400:5. Roku asserts that UEI did not offer evidence that its investments share a nexus to a claim limitation of the 642 patent. *See* RIB at 143. This argument, and Roku’s other arguments pertaining to prong C, are meritless; the UE878 chip plainly corresponds to the microcontroller recited in claim 19 of the 642 patent. *See id.* at 143-44; Tr. (Barnett) at 54:16-17, 65:21-66:1.

Thus, UEI has shown by a preponderance of evidence that it has satisfied prong C for the 642 patent.

VIII. CONCLUSIONS OF LAW

1. The Commission has *in rem* jurisdiction over the Accused Products, electronic devices, including streaming players, televisions, set top boxes, remote controllers, and components thereof.
2. The importation or sale requirement of Section 337 is satisfied for Roku.
3. UEI has been shown to practice claim 19 of U.S. Patent No. 7,589,642.
4. UEI has been shown to practice claims 3, 6, 9, and 11 of U.S. Patent No. 10,600,317.
5. UEI has been shown to have standing to assert U.S. Patent No. 10,593,196.
6. UEI has been shown to practice claims 1 and 2 of the 196 patent.
7. The domestic industry requirement is satisfied with respect to the 642 patent.
8. The domestic industry requirement is satisfied with respect to the 317 patent.
9. The domestic industry requirement is not satisfied with respect to the 196 patent.
10. Roku's Elk Remotes directly infringe claim 19 of the 642 patent.
11. Roku's Alice Remotes do not infringe claim 19 of the 642 patent.
12. Roku directly infringes claims 3, 6, 9, and 11 of the 317 patent.
13. Roku's Ultra and Soundbar directly infringe claims 1, 3, 11, 14, and 15 of the 196 patent.
14. Roku's Revised Ultra and Soundbar do not infringe the 196 patent.
15. Claim 19 of the 642 patent has been shown to be invalid under 35 U.S.C. § 103.
16. Claims 3, 6, 9, and 11 of the 317 patent have been shown to be invalid under 35 U.S.C. § 102 due to anticipation, invalid as obvious under 35 U.S.C. § 103, and not patent eligible under 35 U.S.C. § 101.
17. Claims 1, 3, 11, 13, 14, and 15 of the 196 patent have not been shown to be invalid under 35 U.S.C. § 103.
18. There is no violation of Section 337 with respect to the 642 patent.

19. There is no violation of Section 337 with respect to the 317 patent.
20. There is a violation of Section 337 with respect to the 196 patent.

IX. RECOMMENDED DETERMINATION ON REMEDY AND BOND

The Commission's Rules provide that subsequent to an initial determination on the question of violation of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, the administrative law judge shall issue a recommended determination concerning the appropriate remedy in the event that the Commission finds a violation of section 337, and the amount of bond to be posted by respondent during Presidential review of the Commission action under section 337(j). *See* 19 C.F.R. § 210.42(a)(1)(ii).

The Commission has broad discretion in selecting the form, scope, and extent of the remedy in a section 337 proceeding. *Viscofan, S.A. v. Int'l Trade Comm'n*, 787 F.2d 544, 548 (Fed. Cir. 1986). Under Section 337(d)(1), if the Commission determines as a result of an investigation that there is a violation of section 337, the Commission is authorized to enter either a limited or a general exclusion order. 19 U.S.C. § 1337(d)(1). A limited exclusion order ("LEO") instructs the U.S. Customs and Border Protection ("CBP") to exclude from entry all articles that are covered by the patent at issue and that originate from a named respondent in the investigation. A general exclusion order instructs the CBP to exclude from entry all articles that are covered by the patent at issue, without regard to source. *Certain Purple Protective Gloves*, Inv. No. 337-TA-500, Comm'n Op. at 5 (Dec. 22, 2004). Under section 337(f)(1), the Commission may issue a cease and desist order ("CDO") in addition to, or instead of, an exclusion order. 19 U.S.C. § 1337(f)(1). The Commission generally issues a cease and desist order directed to a domestic respondent when there is a "commercially significant" amount of infringing, imported product in the United States that could be sold, thereby undercutting the remedy provided by an exclusion order. *See Certain Crystalline Cefadroxil Monohydrate*, Inv. No. 337-TA-293, USITC Pub. 2391,

Comm'n Op. on Remedy, the Public Interest and Bonding at 37-42 (June 1991); *Certain Condensers, Parts Thereof and Prods. Containing Same, Including Air Conditioners for Automobiles*, Inv. No. 337-TA-334 (Remand), Comm'n Op. at 26-28 (Sept. 10, 1997).

Additionally, during the 60-day period of Presidential review under 19 U.S.C. § 1337(j), “articles directed to be excluded from entry under subsection (d) . . . shall . . . be entitled to entry under bond prescribed by the Secretary in an amount determined by the Commission to be sufficient to protect the complainant from any injury.” See 19 U.S.C. § 1337(j)(3). “The Commission typically sets the bond based on the price differential between the imported infringing product and the domestic industry article or based on a reasonable royalty. However, where the available pricing or royalty information is inadequate, the bond may be set at one hundred (100) percent of the entered value of the infringing product.” *Certain Industrial Automation Systems and Components Thereof Including Control Systems, Controllers, Visualization Hardware, Motion and Motor Control Systems, Networking Equipment, Safety Devices, and Power Supplies*, Inv. No. 337-TA-1074, Comm'n Op. at 13 (Apr. 23, 2019) (“*Automation Systems*”) (public version) (citation omitted).

A. Limited Exclusion Order

Should a violation be found, UEI argues the Commission “should issue an LEO containing the standard, customary language used by the Commission, namely that the relief should be directed against infringing articles ‘manufactured by or on behalf of’ or ‘imported by or on behalf of’ Roku and its related affiliates and subsidiaries.” CIB at 142. UEI further asserts that “the exclusion order should cover all components of the Accused Products, as well as any products containing the Accused Products.” *Id.* UEI further explains that this means that “the remedial orders should cover infringing remotes that are imported and/or sold along with Roku Players or

other Roku devices.” *Id.* Specifically, “even were Roku to import the remotes separately from a Roku device, and kit them together in the United States for sale, such activities should be covered by the exclusion order.” *Id.* “It should also, by virtue of standard language, cover scenarios where Roku imports products with older (or no) software and flashes it onto products after importation and/or sale.” *Id.* UEI further asserts that no certification or service/repair exception should be included in an LEO order. *Id.*

Roku states that an LEO is not warranted, but if issued, the remedy should be restricted to an LEO “directed only to the Accused Products that have been proven to infringe a valid patent.” RIB at 144. Roku further states that the LEO should “be specific to products with the specific functionality of the Roku OS that have been found to infringe.” *Id.* at 145. Roku further requests that “where a violation is found with respect to claim 19 of the ’642 patent, the LEO should specifically carve out non-accused RF-only, IR-only, and non-programmable RF/IR remote controls and include a certification provision that allows for the importation of such remote controls.” *Id.* Roku further submits that any LEO “should contain an express exemption allowing for Roku to continue to provide [software] updates and services to customers who already own” Accused Products. *Id.*

Should the Commission find a violation, it is recommended that a limited exclusion order issue. As for Roku’s concerns over the non-accused RF-only, IR-only, and non-programmable RF/IR remote controls, it is not recommended the Commission include a standard certification provision within the LEO. According to the Commission, “[t]he standard provision does not allow an importer to simply certify that it is not violating the exclusion order. Rather, CBP only accepts a certification that the goods have been previously determined by CBP or the Commission not to violate the exclusion order.” *See Certain Road Milling Machines and Components Thereof, Inv.*

[REDACTED]

No. 337-TA-1067, Comm'n Op. at 15, 15 n. 5 (Aug. 7, 2019) (citations omitted). Infringement by the RF-only, IR-only, and non-programmable RF/IR remote controls was not evaluated in this investigation and a certification provision is not appropriate.

As for a warranty and repair exception, this involves a consideration of the public interest. *See e.g., Certain Two-Way Radio Equipment and Systems, Related Software and Components Thereof*, Inv. No. 337-TA-1053, Comm'n Op. at 31-32 (Dec. 18, 2018). Public interest was not delegated to the administrative law judge in this investigation. EDIS Doc. No. 685056. Accordingly, no recommendation is provided on this issue.

Finally, Roku submits that because the PTAB issued a Final Written Decision holding many of the claims of the 642 patent and 389 patent to be unpatentable, the Commission should suspend enforcement of any cease and desist orders to any such claims and those substantially similar thereto pending any appeal of the PTAB's decision to the Federal Circuit. *See* RIB at 147. I do not recommend that the Commission suspend enforcement. The only claim that is even tangentially related to the PTAB's Final Written Decision is claim 19 of the 642 patent. The PTAB did not institute an IPR regarding this claim and did not issue a Final Written Decision on this claim. Thus, any decision by the Federal Circuit will have no direct bearing on this claim.

B. Cease and Desist Order

Should a violation be found, UEI argues a CDO is appropriate because Roku maintains and owns inventory of accused products in the United States. CIB at 142, 143, *citing* JX-0067C (Slosek Depo.) at 33:9-18; 40:12-42:8; 47:7-12 (Roku owns and/or controls inventory in U.S. at "JIT"; "JIT Consumer Direct", "Contec" and "In transit"); JPX-0027C [REDACTED] of U.S. inventory of Accused Products); CPX-0125C. UEI further states that the inventory [REDACTED]

[REDACTED] of the subset comprising the 196 Accused Products.” CIB at 143, *citing* JPX-0027C at lines 16-17, 44-94, 98.

In opposition, Roku argues UEI did not meet its burden on the issue and, specifically, UEI “did not even attempt to prove that Roku’s inventory is commercially significant.” *Id.* at 73-74. However, Roku does not dispute that it maintains [REDACTED] of inventory of Accused Products in the United States.

Complainants bear the burden on the issue of cease and desist orders. *Certain Microfluidic Devices*, Inv. No. 337-TA-1068, Comm’n Op. at 23 (Jan. 10, 2020). Such orders “are generally issued when, with respect to the imported infringing products, respondents maintain commercially significant inventories in the United States or have significant domestic operations that could undercut the remedy provided by an exclusion order.” *Id.* at 22-23 (citations omitted). The evidence demonstrates [REDACTED] of inventory are stored in the U.S., which constitutes a significant inventory.

Accordingly, it is recommended that cease and desist orders issue against Roku.

C. Bond

The Commission has held that “[t]he complainant bears the burden of establishing the need for a bond” during the Presidential Review period. *See Robotic Vacuums*, Inv. No. 337-TA-1057, Comm’n Op. at 68. UEI asserts that the price of Accused Products “can vary dramatically”: \$12 for Roku remote to \$100 for a Roku Ultra to \$149 for a Roku Soundbar to thousands of dollars for Roku TVs. CIB at 144, *citing* JPX-0025C; CPX-0127C; CPX-0101C. UEI further asserts that Roku deflates the prices of its products with a goal of monetizing its advertising revenue, making the prices of its products unreliable as a basis for comparison. *Id.*, *citing* JX-0066C (Bright Depo.) at 101:21-102:20. Therefore, UEI asserts, a reasonable royalty is not readily discernable because

there is no “standard” rate for licensing technology for remote control of televisions or set top boxes. *Id.* UEI submits that a 100% bond is thus appropriate to prevent harm to UEI during the Presidential review period. *Id.*

UEI has not shown the need for a bond in the event of a violation. While the Commission has made clear that a 100% bond is appropriate when a price differential is not practical or not possible given the record, the overall focus is to protect the complainant from injury. *Non-Volatile Memory*, Inv. No. 337-TA-1046, Comm’n Op. at 67, *citing* 19 C.F.R. § 210.50(a)(3). UEI offers no evidence that it competes with Roku, and concedes that a reasonable royalty is not ascertainable, and thus, no bond is warranted. *Certain Digital Video Receivers and Related Hardware and Software Components*, Inv. No. 337-TA-1103, Comm’n Op. at 32 (May 13, 2020) (“The Commission agrees with the RD’s conclusion that Rovi failed to justify the need for a bond, including that Rovi did not establish an appropriate price differential in view of the absence of reliable pricing information . . . or royalty rate, where Rovi failed to show the role of these patents in the portfolio patent licenses.”).

Accordingly, it is recommended that no bond requirement should issue.

X. INITIAL DETERMINATION AND ORDER

Based on the foregoing,⁵ it is my Initial Determination that there is a violation of Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain electronic devices, including streaming players, televisions, set top boxes, remote controllers, and

⁵ The failure to discuss any matter raised by the parties or any portion of the Record herein does not indicate that said matter was not considered. Rather, any such matter(s) or portion(s) of the Record has/have been determined to be irrelevant, immaterial or meritless. Arguments made on brief which were otherwise unsupported by Record evidence or legal precedent have been accorded no weight.

components thereof, in connection with the asserted claims of U.S. Patent No. 10,593,196. It is also my Initial Determination that there is no violation of Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain electronic devices, including streaming players, televisions, set top boxes, remote controllers, and components thereof, in connection with the asserted claims of U.S. Patent Nos. 7,589,642 and 10,600,317.

Furthermore, it is my determination that a domestic industry in the United States exists that practices or exploits U.S. Patent No. 7,589,642, 10,600,317, and 10,593,196.

I certify to the Commission this Initial Determination, together with the Record of the hearing in this investigation consisting of the following: the transcript of the evidentiary hearing, with appropriate corrections as may hereafter be ordered; and the exhibits accepted into evidence in this investigation.⁶

Pursuant to 19 C.F.R. § 210.42(h), this Initial Determination shall become the determination of the Commission sixty (60) days after the date of service of the Initial Determination, unless a party files a petition for review of the Initial Determination within twelve (12) business days after service of the Initial Determination pursuant to 19 C.F.R. § 210.43(a) or the Commission, pursuant to 19 C.F.R. § 210.44, orders on its own motion, a review of the Initial Determination or certain issues therein. Any issue or argument not raised in a petition for review, or response thereto, will be deemed to have been abandoned and may be disregarded by the Commission in reviewing the Initial Determination pursuant to 19 C.F.R. § 210.43(b) and (c).

⁶ The pleadings of the parties filed with the Secretary need not be certified as they are already in the Commission's possession in accordance with Commission rules.

~~CONFIDENTIAL MATERIAL OMITTED~~**Confidentiality Notice:**

This Initial Determination is being issued as confidential, and a public version will be issued pursuant to Commission Rule 210.5(f). Within seven (7) days of the date of this Initial Determination, the parties shall jointly submit: (1) a proposed public version of this opinion with any proposed redactions bracketed in red; and (2) a written justification for any proposed redactions specifically explaining why the piece of information sought to be redacted is confidential and why disclosure of the information would be likely to cause substantial harm or likely to have the effect of impairing the Commission's ability to obtain such information as is necessary to perform its statutory functions.⁷

SO ORDERED.



Cameron Elliot
Administrative Law Judge

⁷ Under Commission Rules 210.5 and 201.6(a), confidential business information includes information which concerns or relates to the trade secrets, processes, operations, style of works, or apparatus, or to the production, sales, shipments, purchases, transfers, identification of customers, inventories, or amount or source of any income, profits, losses, or expenditures of any person, firm, partnership, corporation, or other organization, or other information of commercial value, the disclosure of which is likely to have the effect of either impairing the Commission's ability to obtain such information as is necessary to perform its statutory functions, or causing substantial harm to the competitive position of the person, firm, partnership, corporation, or other organization from which the information was obtained, unless the Commission is required by law to disclose such information. *See* 19 C.F.R. § 201.6(a). Thus, to constitute confidential business information the disclosure of the information sought to be designated confidential must likely have the effect of either: (1) impairing the Commission's ability to obtain such information as is necessary to perform its statutory functions; or (2) causing substantial harm to the competitive position of the person, firm, partnership, corporation, or other organization from which the information was obtained.

CONFIDENTIAL MATERIAL OMITTED

I, Lisa R. Barton, hereby certify that the attached **INITIAL DETERMINATION** has been served upon the following parties as indicated, on **July 9, 2021**.



Lisa R. Barton, Secretary
U.S. International Trade Commission
500 E Street, SW, Room 112
Washington, DC 20436

On Behalf of Complainant Universal Electronics, Inc.:

Adam D. Swain, Esq.
ALSTON & BIRD LLP
950 F Street NW
Washington, DC 20004
Email: Adam.Swain@alston.com

- ☐ Via Hand Delivery
- ☐ Via Express Delivery
- ☐ Via First Class Mail
- ☒ Other: Email Notification
of Availability for Download

On Behalf of Respondent Roku Inc.:

Matthew J. Rizzolo, Esq.
ROPES & GRAY LLP
2099 Pennsylvania Avenue, NW
Washington, DC 20006
Email: matthew.rizzolo@ropesgray.com

- ☐ Via Hand Delivery
- ☐ Via Express Delivery
- ☐ Via First Class Mail
- ☒ Other: Email Notification
of Availability for Download

On Behalf of Respondents Funai Electric Co., Ltd., Funai Corporation Inc., Funai (Thailand) Co., Ltd., Hisense Co. Ltd., Hisense Electronics Manufacturing Company of America Corporation d/b/a Hisense USA, Hisense Import & Export Co. Ltd, Qingdao Hisense Electric Co., Ltd., and Hisense International (HK) Co., Ltd.:

Jordan L. Coyle, Esq.
ORRICK, HERRINGTON & SUTCLIFFE LLP
Columbia Center
1152 15th Street, NW
Washington, DC 20005
Email: jcoyle@orrick.com

- ☐ Via Hand Delivery
- ☐ Via Express Delivery
- ☐ Via First Class Mail
- ☒ Other: Email Notification
of Availability for Download

On Behalf of Respondents TCL Electronics Holdings Limited, f/k/a TCL Multimedia Holdings Limited, Shenzhen TCL New Technology Company Limited, TCL King Electrical Appliances (Huizhou) Company Limited, TTE Technology Inc. d/b/a/ TCL USA and TCL North America, TCL Corp., TCL Moka, Int'l Ltd., TCL Overseas Marketing Ltd., TCL Industries Holdings Co., Ltd., and TCL Smart Device (Vietnam) Company, Ltd.

John P. Schnurer, Esq.
PERKINS COIE LLP
11452 El Camino Real, Suite 300
San Diego, CA 92130
Email: JSchnurer@perkinscoie.com

- ☐ Via Hand Delivery
- ☐ Via Express Delivery
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US010593196B2

(12) **United States Patent**
Arling

(10) **Patent No.:** **US 10,593,196 B2**
(45) **Date of Patent:** ***Mar. 17, 2020**

(54) **SYSTEM AND METHOD FOR OPTIMIZED APPLIANCE CONTROL**

(71) Applicant: **Universal Electronics Inc., Santa Ana, CA (US)**

(72) Inventor: **Paul D. Arling, Irvine, CA (US)**

(73) Assignee: **UNIVERSAL ELECTRONICS INC., Santa Ana, CA (US)**

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **16/197,748**

(22) Filed: **Nov. 21, 2018**

(65) **Prior Publication Data**

US 2019/0096235 A1 Mar. 28, 2019

Related U.S. Application Data

(63) Continuation of application No. 15/789,547, filed on Oct. 20, 2017, now Pat. No. 10,325,486, which is a (Continued)

(51) **Int. Cl.**
G08C 17/02 (2006.01)
G08C 23/04 (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC **G08C 17/02** (2013.01); **G08C 23/04** (2013.01); **H04N 21/42226** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC **G08C 17/02**; **G08C 23/04**; **G08C 2201/20**;
G08C 23/30; **G08C 23/40**; **G08C 23/70**;
(Continued)

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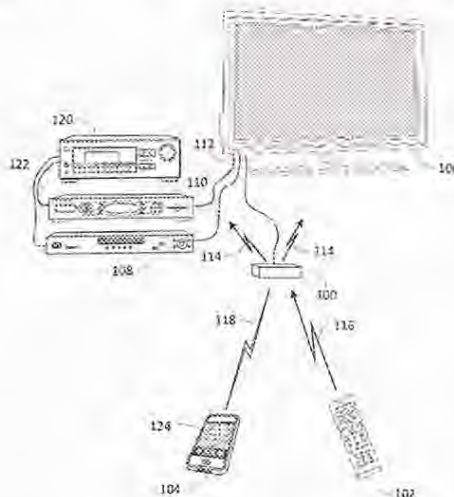
Primary Examiner—Adnan Aziz

(74) *Attorney, Agent, or Firm*—Greenberg Traurig, LLP

(57) **ABSTRACT**

In response to a detected presence of an intended target appliance within a logical topography of controllable appliances identity information associated with the intended target appliance is used to automatically add to a graphical user interface of a controlling device an icon representative of the intended target appliance and to create at a Universal Control Engine a listing of communication methods for use in controlling corresponding functional operations of the intended target appliance. When the icon is later activated, the controlling device is placed into an operating state appropriate for controlling functional operations of the intended target appliance while the Universal Control Engine uses at least one of the communication methods to transmit at least one command to place the intended target appliance into a predetermined operating state.

22 Claims, 14 Drawing Sheets



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Related U.S. Application Data

continuation of application No. 15/259,847, filed on Sep. 8, 2016, now Pat. No. 9,842,492, which is a continuation of application No. 14/136,023, filed on Dec. 20, 2013, now Pat. No. 9,449,500, which is a continuation-in-part of application No. 13/899,671, filed on May 22, 2013, now Pat. No. 9,437,105, which is a continuation of application No. 13/657,176, filed on Oct. 22, 2012, now Pat. No. 9,215,394.

- (60) Provisional application No. 61/552,857, filed on Oct. 28, 2011, provisional application No. 61/680,876, filed on Aug. 8, 2012.

- (51) **Int. Cl.**
H04N 21/422 (2011.01)
H04N 21/4363 (2011.01)

- (52) **U.S. Cl.**
CPC G08C 2201/20 (2013.01); G08C 2201/30 (2013.01); G08C 2201/40 (2013.01); G08C 2201/70 (2013.01); G08C 2201/92 (2013.01); G08C 2201/93 (2013.01); H04N 21/42225 (2013.01); H04N 21/4363 (2013.01)

- (58) **Field of Classification Search**
CPC .. G08C 23/92; G08C 23/93; H04N 21/42226; H04N 21/42225; H04N 21/4363
See application file for complete search history.

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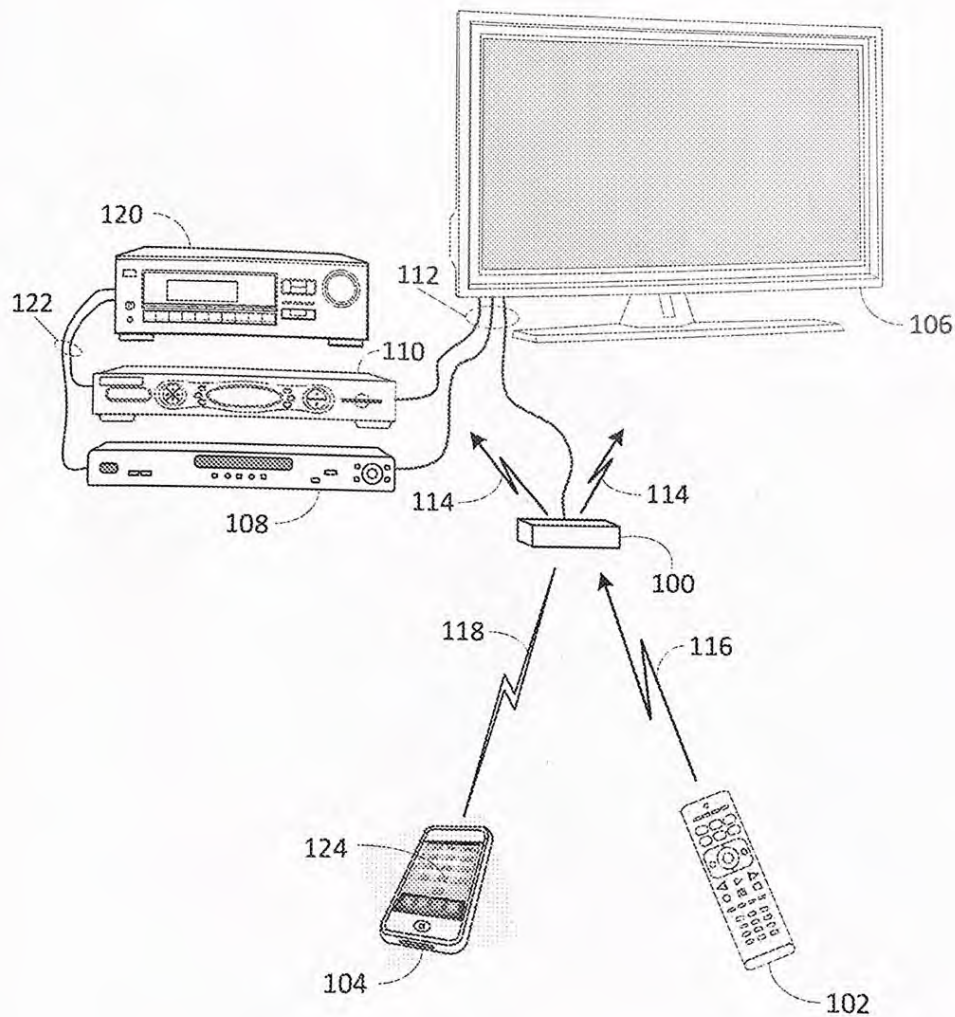


Figure 1

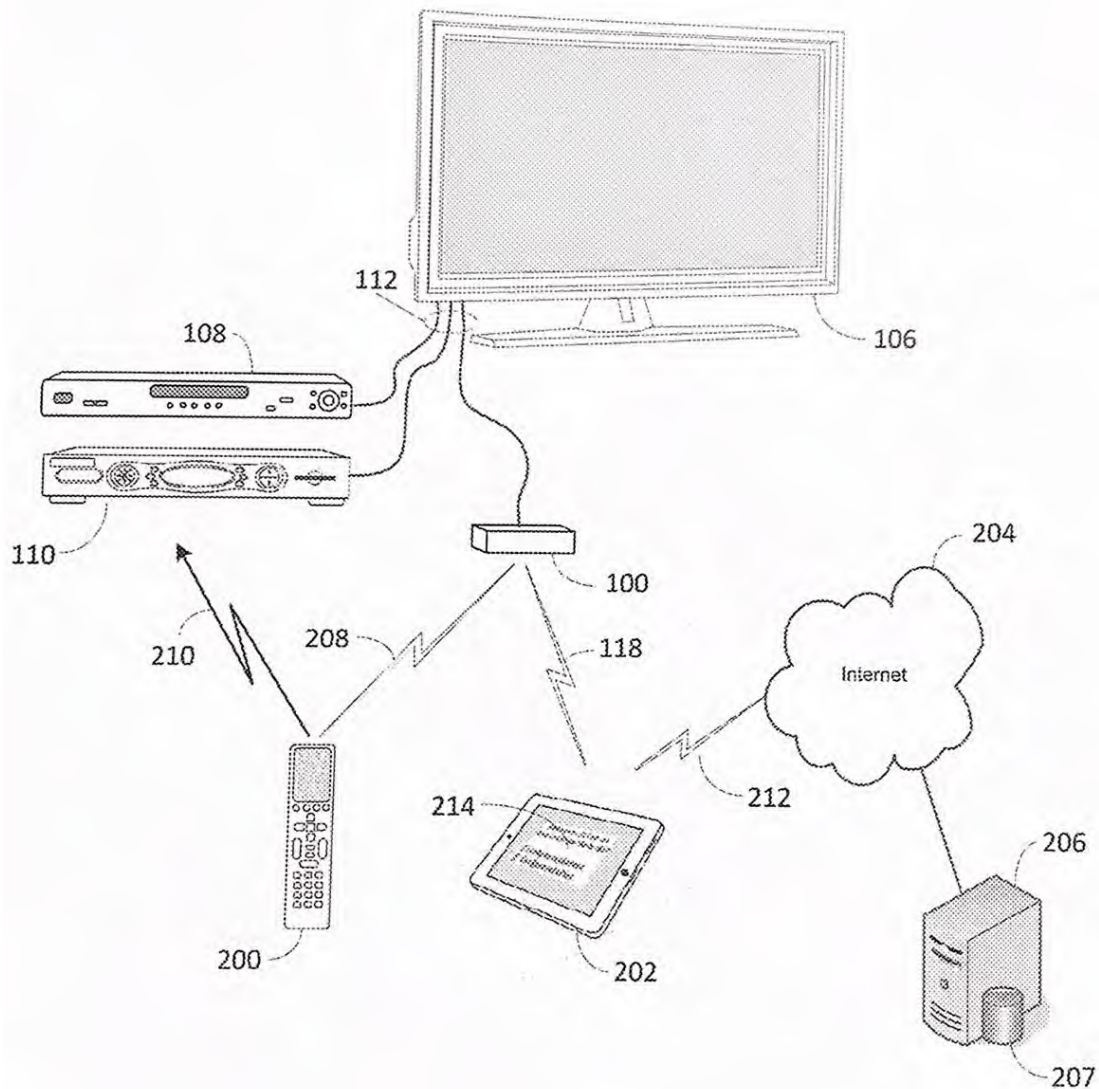


Figure 2

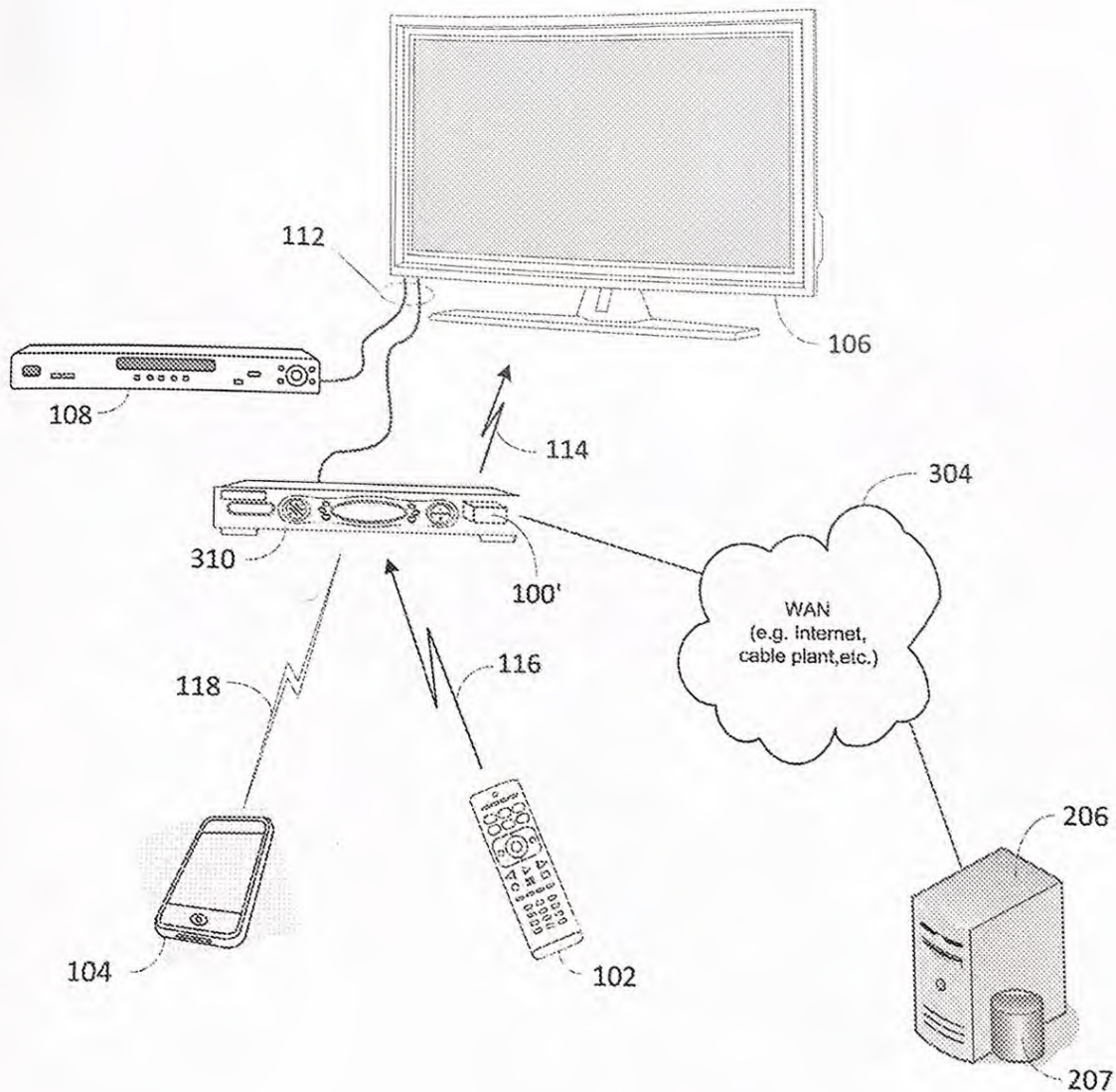


Figure 3

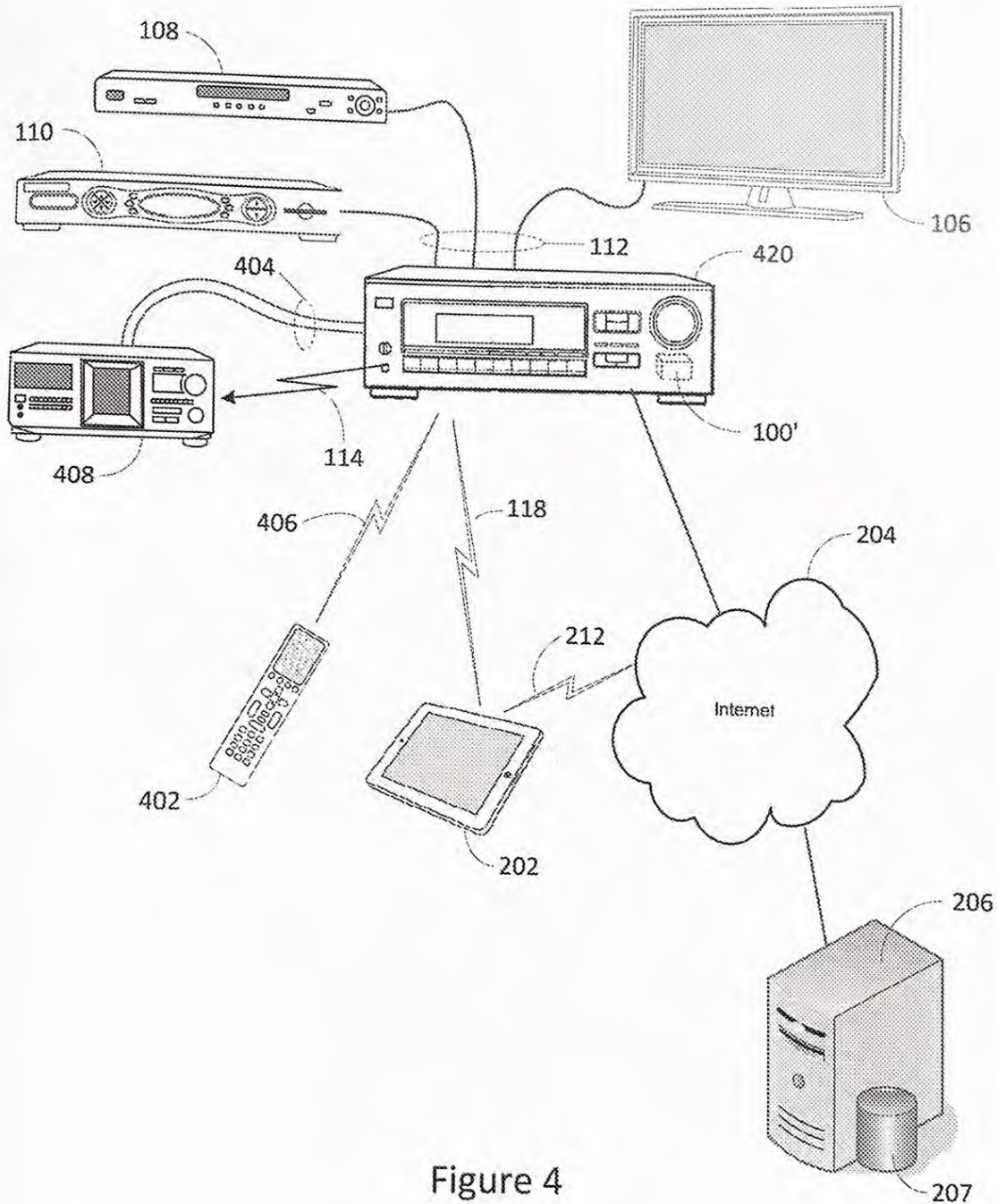


Figure 4

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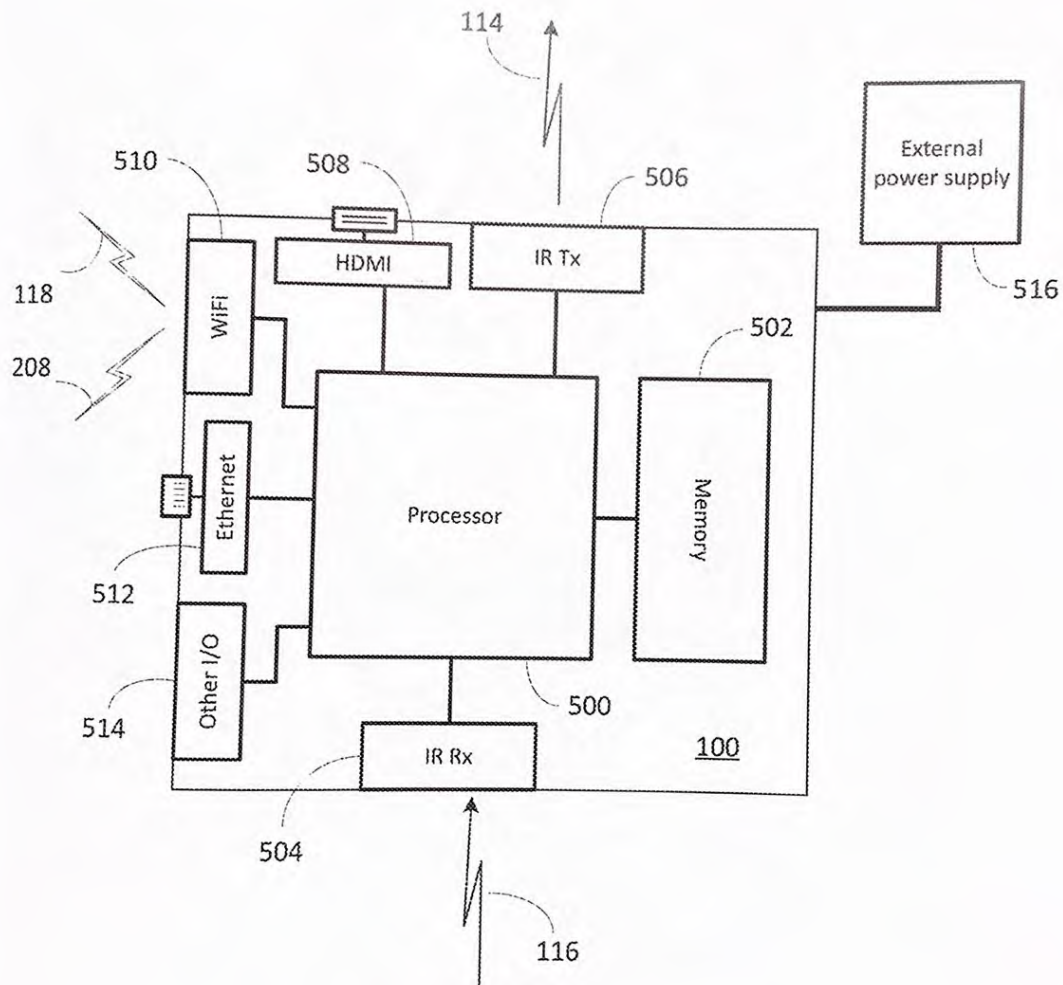


Figure 5

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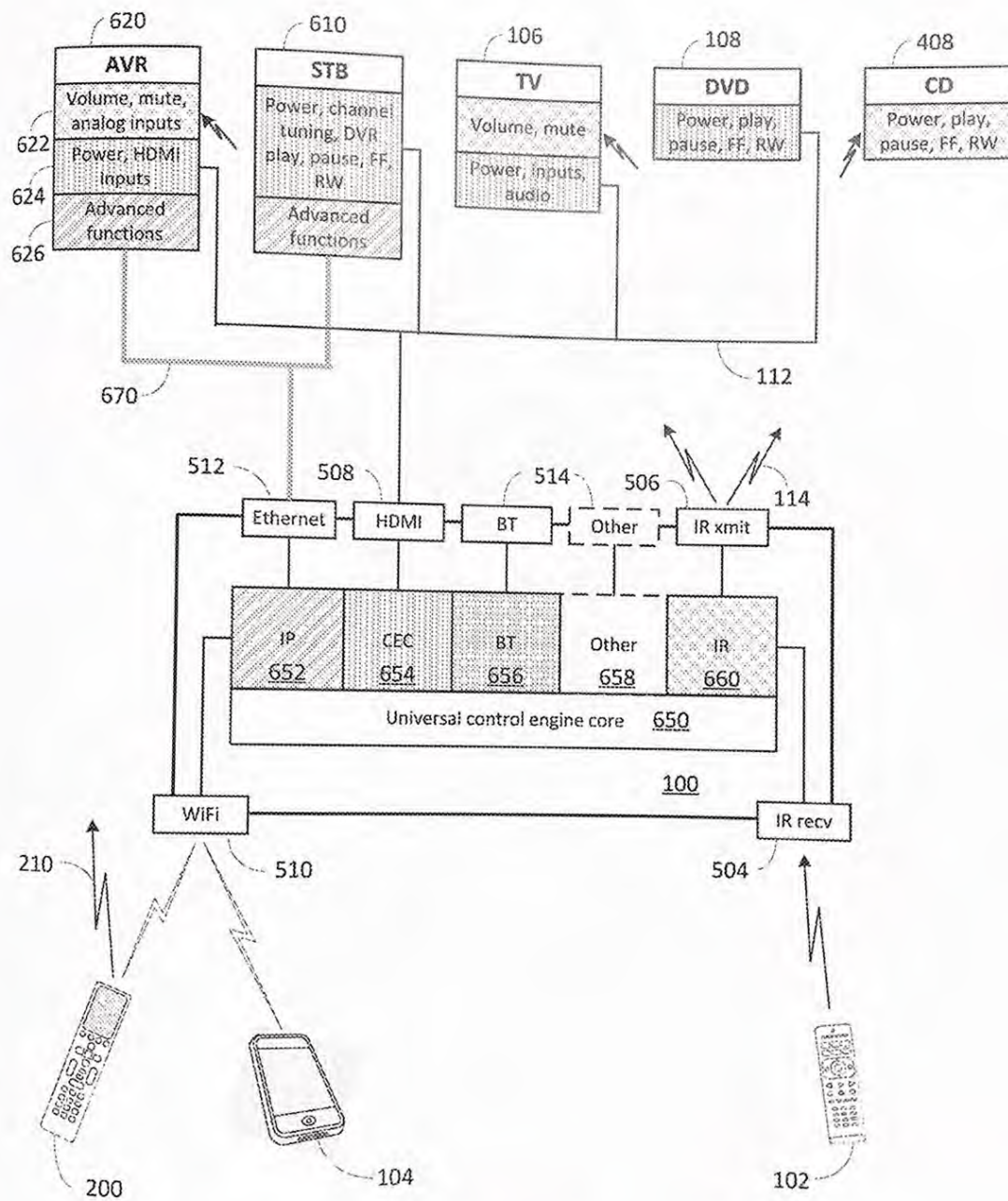


Figure 6

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Function	Appliance					
	TV	AVR	STB/DVR	DVD	CD	Etc.....
Power on	CEC	CEC	CEC	CEC	IR	---
Power off	CEC	CEC	CEC	CEC	IR	---
Volume up	IR	CEC	n/a	n/a	n/a	---
Volume down	IR	CEC	n/a	n/a	n/a	---
Mute	IR	CEC	n/a	n/a	n/a	---
Play	n/a	n/a	CEC	CEC	IR	---
Pause	n/a	n/a	CEC	CEC	IR	---
FF	n/a	n/a	CEC	CEC	IR	---
Rew	n/a	n/a	CEC	CEC	IR	---
Sound field A	CEC	IP	IP	n/a	n/a	---
Sound field B	CEC	IP	IP	n/a	n/a	---
Input 1	CEC	IR	n/a	n/a	n/a	---
Input 2	CEC	IR	n/a	n/a	n/a	---
Etc.....						

Figure 7

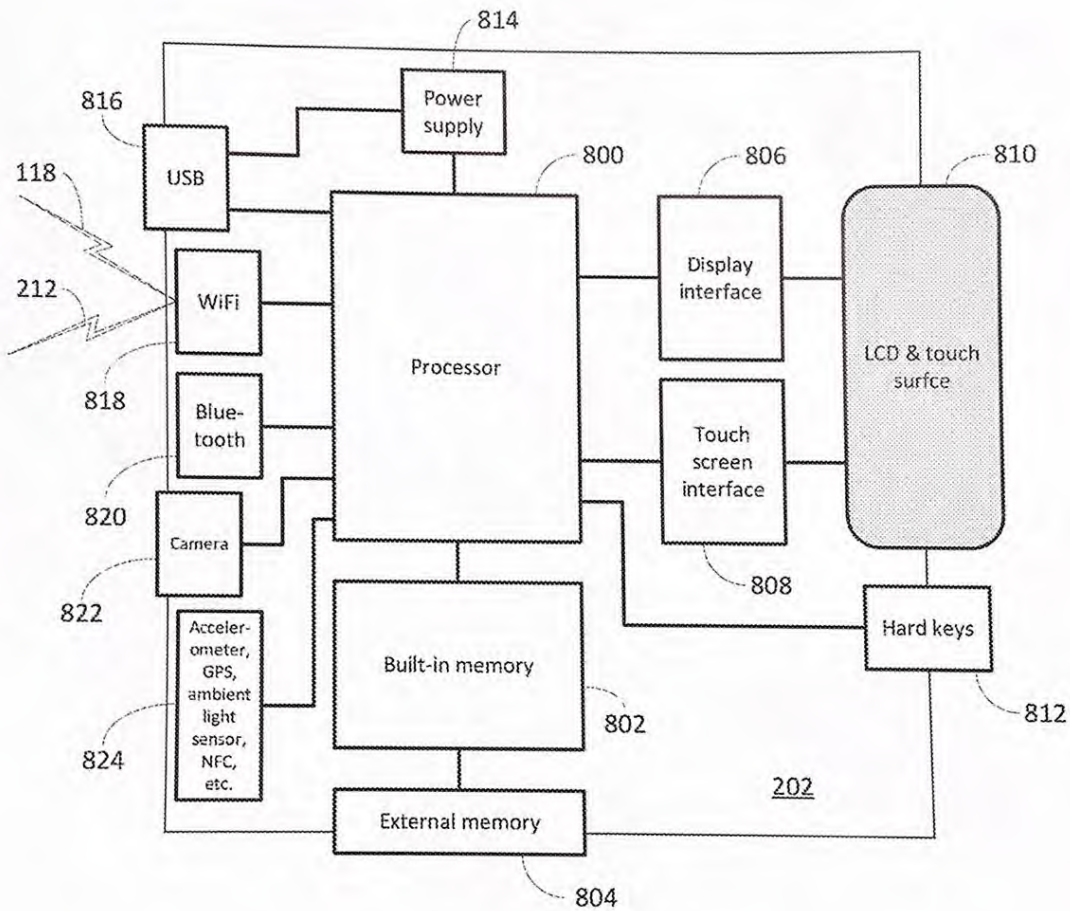


Figure 8

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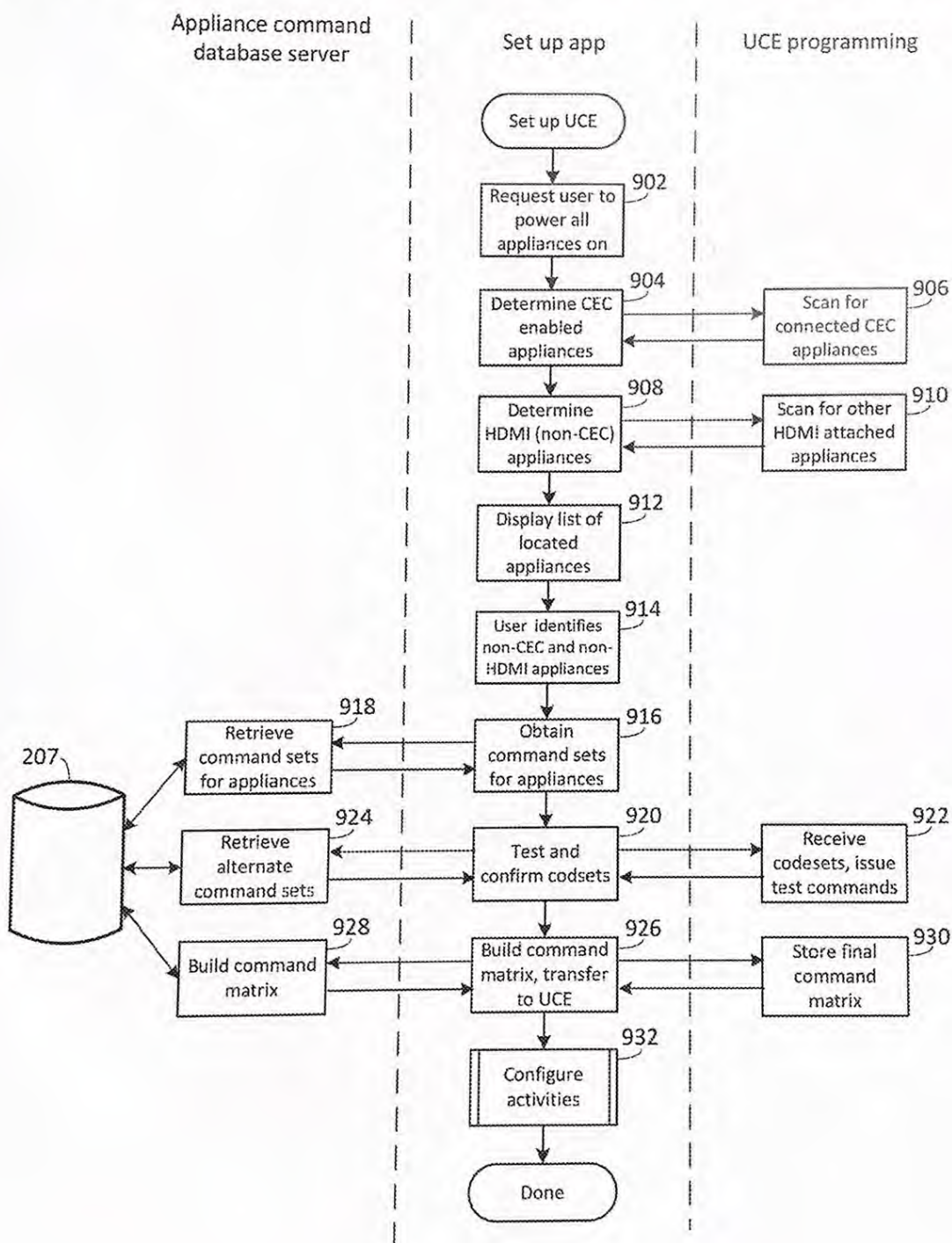


Figure 9

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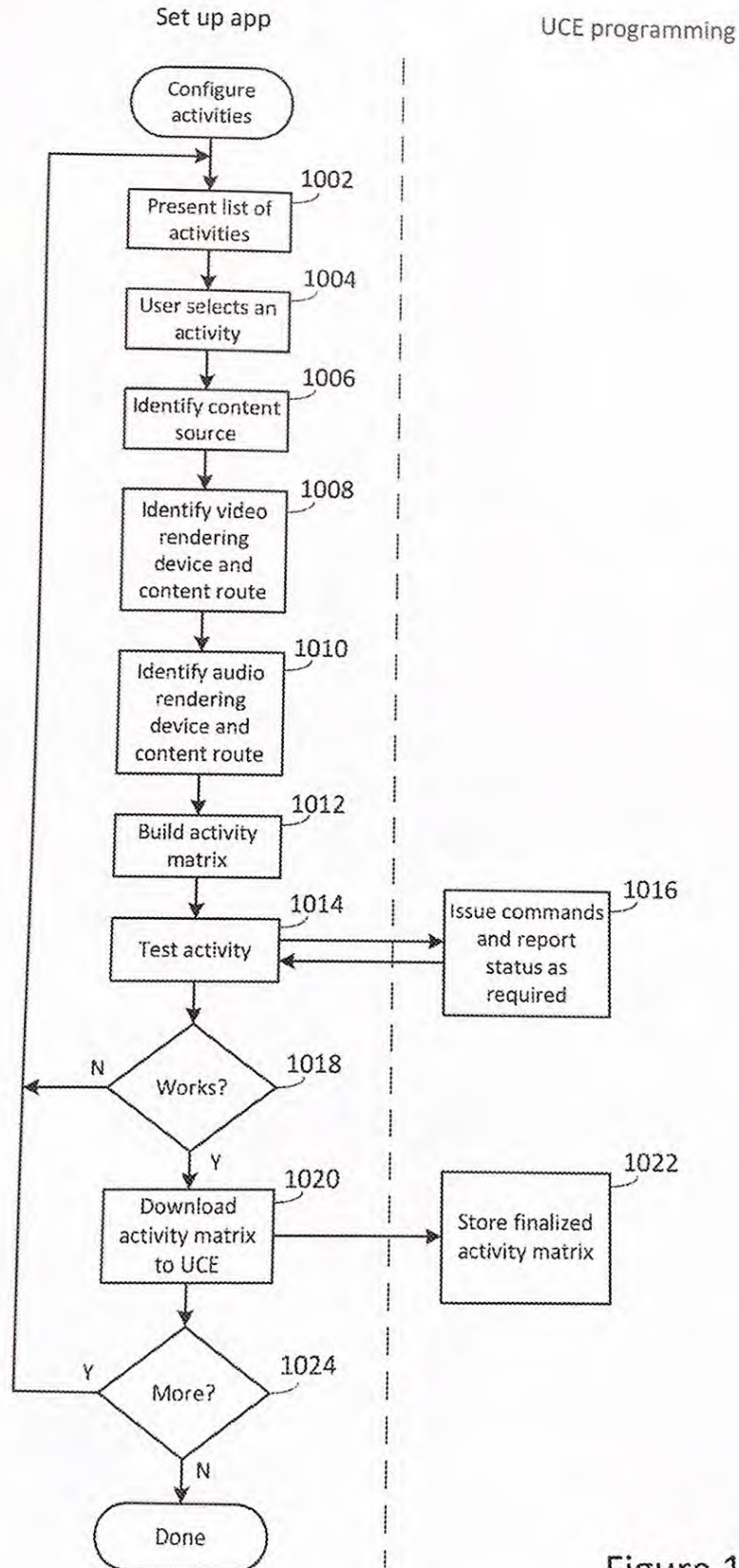


Figure 10

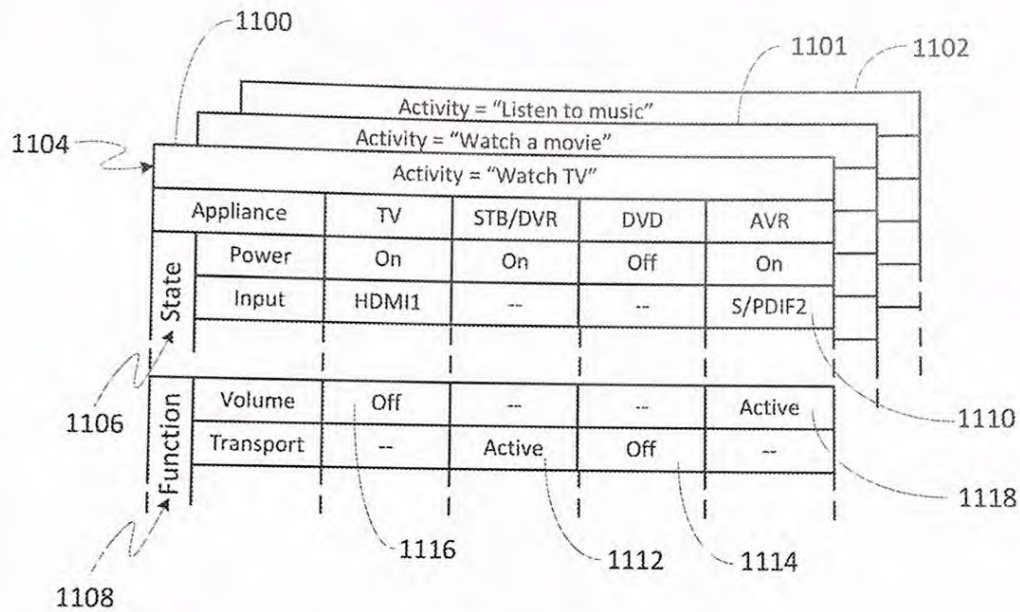


Figure 11

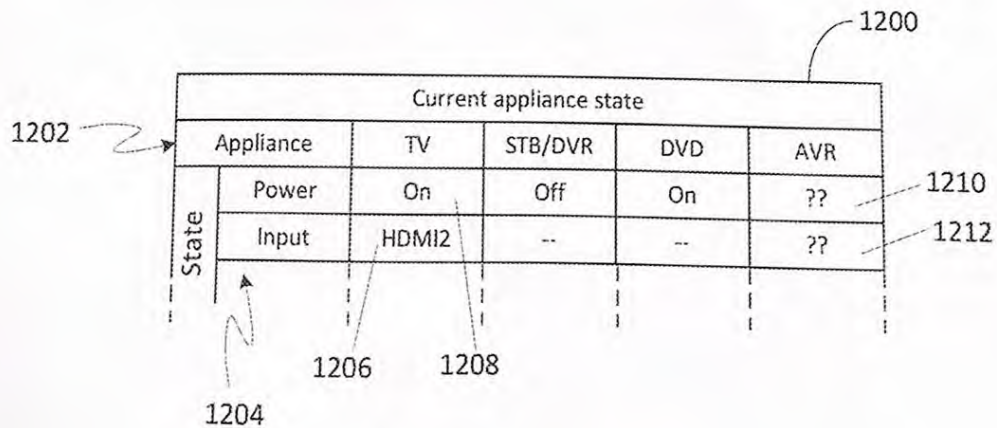


Figure 12

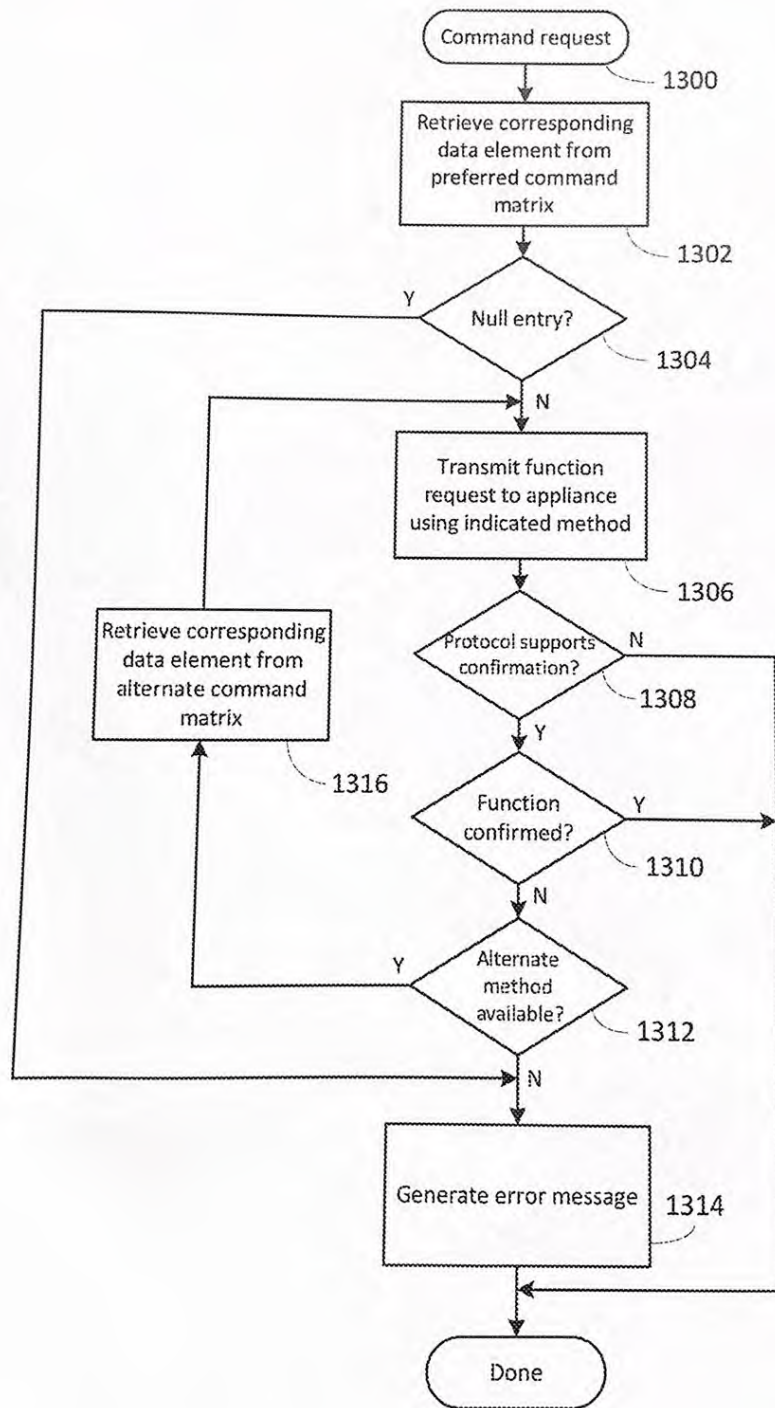


Figure 13

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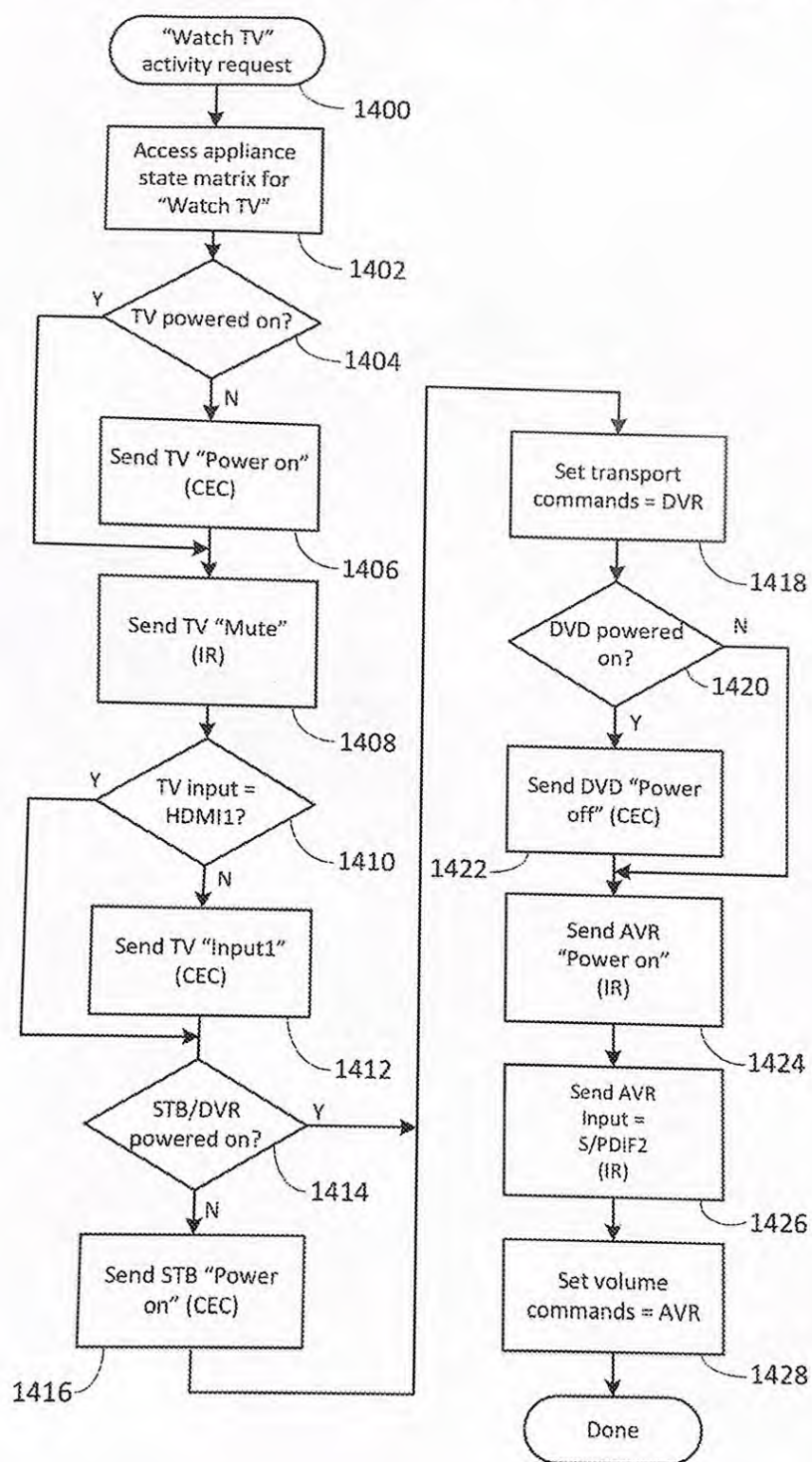
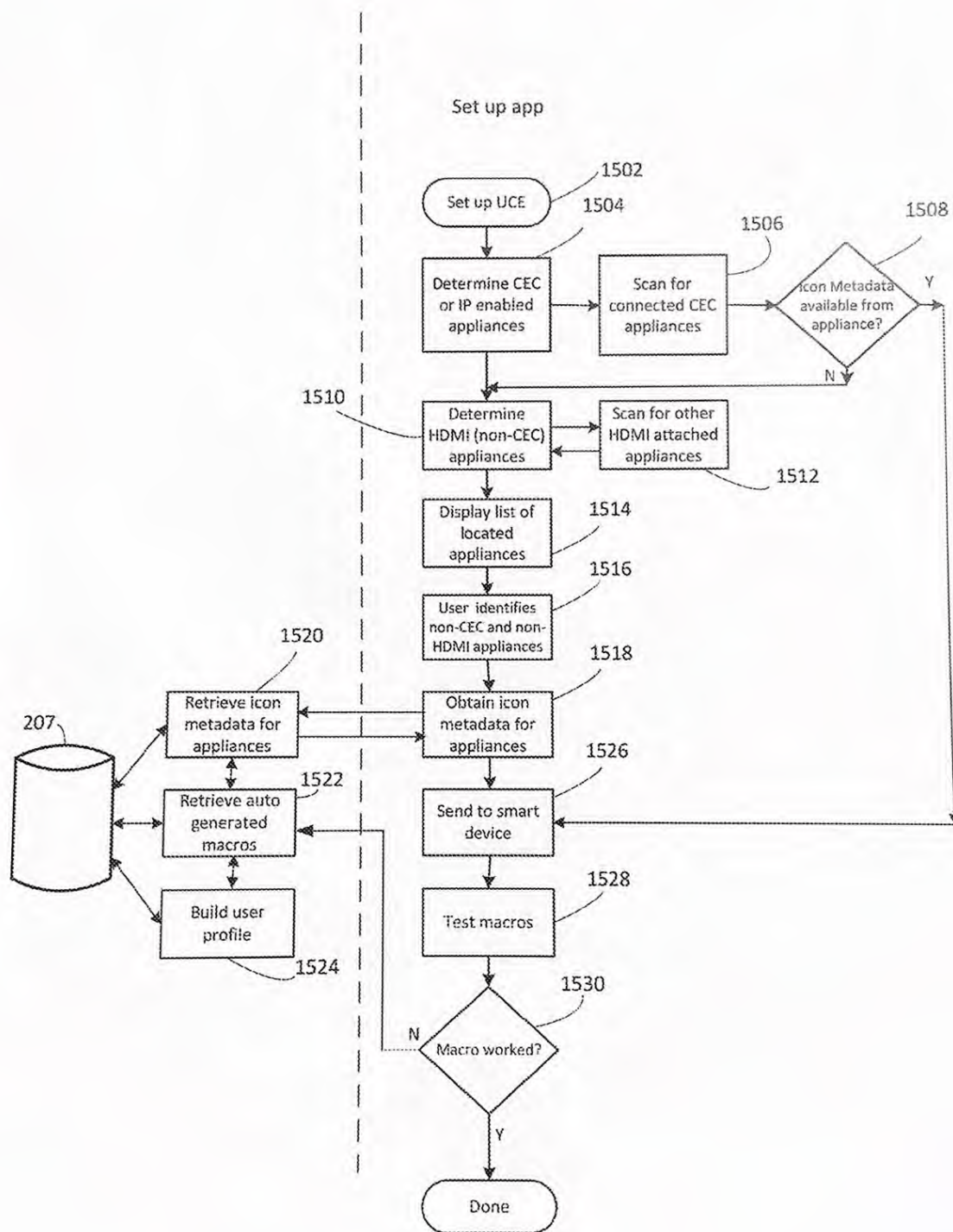


Figure 14



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**SYSTEM AND METHOD FOR OPTIMIZED
APPLIANCE CONTROL****RELATED APPLICATION INFORMATION**

This application claims the benefit of and is a continuation of U.S. application Ser. No. 15/789,547, filed on Oct. 20, 2017, which application claims the benefit of and is a continuation of U.S. application Ser. No. 15/259,847, filed on Sep. 8, 2016, which application claims the benefit of and is a continuation of U.S. application Ser. No. 14/136,023, filed on Dec. 20, 2013, which application claims the benefit of and is a continuation-in-part of U.S. application Ser. No. 13/899,671, filed on May 22, 2013, which application claims the benefit of and is a continuation of U.S. application Ser. No. 13/657,176, filed on Dec. 22, 2012, which application claims the benefit of U.S. Provisional Application No. 61/552,857, filed Oct. 28, 2011, and U.S. Provisional Application No. 61/680,876, filed Aug. 8, 2012, the disclosures of which are incorporated herein by reference in their entirety.

This application is also related to U.S. patent application Ser. No. 12/621,277, filed on Nov. 18, 2009 and entitled "System and Method for Reconfiguration of an Entertainment System Controlling Device," which in turn is a continuation-in-part of U.S. patent application Ser. No. 12/569,121 (now U.S. Pat. No. 8,243,207), filed on Sep. 29, 2009 and entitled "System and Method for Activity Based Configuration of an Entertainment System," the disclosures of which are incorporated herein by reference in their entirety.

This application is also related to U.S. patent application Ser. No. 13/198,072, filed on Aug. 4, 2011 and entitled "System and Method for Configuring the Remote Control Functionality of a Portable Device," the disclosure of which is incorporated herein by reference in its entirety.

This application is also related to U.S. patent application Ser. No. 13/240,604, filed on Sep. 22, 2011 and entitled "System and Method for Configuring Controlling Device Functionality," the disclosure of which is incorporated herein by reference in its entirety.

BACKGROUND

Controlling devices, for example remote controls, for use in issuing commands to entertainment and other appliances, and the features and functionality provided by such controlling devices are well known in the art. In order to facilitate such functionality, various communication protocols, command formats, and interface methods have been implemented by appliance manufacturers to enable operational control of entertainment and other appliances, also as well known in the art. In particular, the recent proliferation of wireless and wired communication and/or digital interconnection methods such as WiFi, Bluetooth, HDMI, etc., amongst and between appliances has resulted in a corresponding proliferation of such communication protocols and command formats. While many of these newer methods may offer improved performance and/or reliability when compared to previous control protocols, appliance manufacturer adoption of such newer methods remains inconsistent and fragmented. This, together with the large installed base of prior generation appliances, may cause confusion, misoperation, or other problems when a user or manufacturer of a controlling device, such as a remote control, attempts to take advantage of the enhanced features and functionalities of these new control methods.

SUMMARY OF THE INVENTION

This invention relates generally to enhanced methods for appliance control via use of a controlling device, such as a

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remote control, smart phone, tablet computer, etc., and in particular to methods for taking advantage of improved appliance control communication methods and/or command formats in a reliable manner which is largely transparent to a user and/or seamlessly integrated with legacy appliance control technology.

To this end, the instant invention comprises a modular hardware and software solution, hereafter referred to as a Universal Control Engine (UCE), which is adapted to provide device control across a variety of available control methodologies and communication media, such as for example various infrared (IR) remote control protocols; Consumer Electronic Control (CEC) as may be implemented over a wired HDMI connection; internet protocol (IP), wired or wireless; RF4CE wireless; Bluetooth (BT) wireless personal area network(s); UPnP protocol utilizing wired USB connections; or any other available standard or proprietary appliance command methodology. Since each individual control paradigm may have its own strengths and weaknesses, the UCE may be adapted to combine various control methods in order to realize the best control option for each individual command for each individual device.

The UCE itself may be adapted to receive commands from a controlling device, for example, a conventional remote control or a remote control app resident on a smart device such as a phone or tablet, etc., utilizing any convenient protocol and command structure (IR, RF4CE, BT, proprietary RF, etc.) As will become apparent, the controlling device may range from a very simple unidirectional IR device to a fully functional WiFi enabled smart phone or the like. The UCE may receive command requests from such a controlling device and apply the optimum methodology to propagate the command function(s) to each intended target appliance, such as for example a TV, AV receiver, DVD player, etc. In this manner the UCE may enable a single controlling device to command the operation of all appliances in a home theater system while coordinating available methods of controlling each particular appliance in order to select the best and most reliable method for issuing each command to each given device. By way of example without limitation, a UCE may utilize IR commands to power on an AV receiver appliance while CEC commands or another method may be used to select inputs or power down the same AV receiver appliance; or CEC commands may be used to power on and select inputs on a TV appliance while IR commands may be used to control the volume on the same TV appliance.

As will become apparent, a UCE may comprise modular hardware and software which may be embodied in a stand-alone device suitable for use in an existing home theater equipment configuration, or may be incorporated into any one of the appliances such as a STB, TV, AV receiver, HDMI switch etc. Further, when incorporated into an appliance, UCE functionality may be provisioned as a separate hardware module or may be incorporated together with other hardware functionality, e.g., as part of an HDMI interface IC or chip set, etc.

A better understanding of the objects, advantages, features, properties and relationships of the invention will be obtained from the following detailed description and accompanying drawings which set forth illustrative embodiments and which are indicative of the various ways in which the principles of the invention may be employed.

BRIEF DESCRIPTION OF THE DRAWINGS

For a better understanding of the various aspects of the invention, reference may be had to preferred embodiments shown in the attached drawings in which:

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FIGS. 1 and 2 illustrate exemplary systems in which a standalone UEC device may be utilized to command operation of several appliances;

FIGS. 3 and 4 illustrate exemplary systems in which UEC functionality may be incorporated into an appliance which is part of a home entertainment system;

FIG. 5 illustrates a block diagram of an exemplary UEC device;

FIG. 6 illustrates a graphical representation of an exemplary UCE-based control environment;

FIG. 7 illustrates an exemplary preferred command matrix for use in a UCE-based control environment, for example as illustrated in FIG. 6;

FIG. 8 illustrates a block diagram of an exemplary smart device which may support a remote control app and a setup method for use in configuring a UCE;

FIG. 9 illustrates an exemplary series of steps which may be performed in order to set up and configure an exemplary UCE;

FIG. 10 illustrates an exemplary series of steps which may be performed in order to define to a UCE an appliance configuration which corresponds to a user activity;

FIG. 11 illustrates exemplary activity configuration matrices such as may be defined during the steps of FIG. 10;

FIG. 12 illustrates an exemplary current appliance state matrix which may be maintained by a UCE for use in determining the commands necessary to invoke one of the states defined by the matrix of FIG. 11;

FIG. 13 illustrates an exemplary series of steps which may be performed by a UCE in issuing a function command to an appliance;

FIG. 14 illustrates an exemplary series of steps which may be performed by a UCE in establishing appliance states matching a desired activity defined in one of the matrices of FIG. 11; and

FIG. 15 illustrates an exemplary series of steps which may be performed by a smart device to setup command control macros.

DETAILED DESCRIPTION

With reference to FIG. 1, there is illustrated an exemplary system in which a UCE device 100 may be used to issue commands to control various controllable appliances, such as a television 106, a cable set top box combined with a digital video recorder ("STB/DVR") 110, a DVD player 108, and an AV receiver 120. While illustrated in the context of a television 106, STB/DVR 110, a DVD player 108, and an AV receiver 120, it is to be understood that controllable appliances may include, but need not be limited to, televisions, VCRs, DVRs, DVD players, cable or satellite converter set-top boxes ("STBs"), amplifiers, CD players, game consoles, home lighting, drapery, fans, HVAC systems, thermostats, personal computers, etc. In the illustrative example of FIG. 1, appliance commands may be issued by UCE 100 in response to infrared ("IR") request signals 116 received from a remote control device 102, radio frequency ("RF") request signals 118 received from an app 124 resident on a smart device 104, or any other device from which UCE 100 may be adapted to receive requests, using any appropriate communication method. As illustrated, transmission of the requested appliance commands from the UCE to appliances 106, 108, 110, 120 may take the form of wireless IR signals 114 or CEC commands issued over a wired HDMI interface 112, as appropriate to the capabilities of the particular appliance to which each command may be directed. In particular, in the exemplary system illustrated, AV

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receiver 120 may not support HDMI inputs, being connected to audio source appliances 108, 110 via, for example S/PDIF interfaces 122. Accordingly UCE 100 may be constrained to transmit all commands destined for AV receiver 120 exclusively as IR signals, while commands destined for the other appliances 106 through 110 may take the form of either CEC or IR signals as appropriate for each command. By way of example without limitation, certain TV manufacturers may elect not to support volume adjustment via CEC. If the illustrative TV 106 is of such manufacture, UCE 100 may relay volume adjustment requests to TV 106 as IR signals 114, while other requests such as power on/off or input selections may be relayed in the form of CEC commands over HDMI connection 112.

It will however be appreciated that while illustrated in the context of IR, RF, and wired CEC signal transmissions, in general, transmissions to and from UCE device 100 may take the form of any convenient IR, RF, hardwired, point-to-point, or networked protocol, as necessary for a particular embodiment. Further, while wireless communications 116, 118, etc., between exemplary devices are illustrated herein as direct links, it should be appreciated that in some instances such communication may take place via a local area network or personal area network, and as such may involve various intermediary devices such as routers, bridges, access points, etc. Since these items are not necessary for an understanding of the instant invention, they are omitted from this and subsequent Figures for the sake of clarity.

Since smart device remote control apps such as that contemplated in the illustrative device 104 are well known, for the sake of brevity the operation, features, and functions thereof will not be described in detail herein. Nevertheless, if a more complete understanding of the nature of such apps is desired, the interested reader may turn to, for example, the before mentioned U.S. patent application Ser. No. 12/406,601 or U.S. patent application Ser. No. 13/329,940, (now U.S. Pat. No. 8,243,207).

Turning now to FIG. 2, in a further illustrative embodiment, UCE 100 may receive wireless request signals from a remote control 200 and/or an app resident on a tablet computer 202. As before, command transmissions to appliances 106, 108, 110 may take the form of wired CEC commands or wireless IR commands. However, in this example remote control 200 may be in bi-directional communication 208 with UCE 100 and accordingly the UCE may delegate the transmission of IR commands 210 to the remote control device 200, i.e., use remote control 200 as a relay device for those commands determined to be best executed via IR transmissions. As also generally illustrated in FIG. 2, a setup app 214 executing on a smart device such as tablet computer 202 may be utilized in conjunction with an Internet (212, 204) accessible or cloud based server 206 and associated database 207 to initially configure UCE 100 for operation with the specific group of appliances to be controlled, i.e., to communicate to UCE 100 a matching command code set and capability profile for each particular appliance to be controlled, for example based on type, manufacture, model number, etc., as will be described in greater detail hereafter.

With reference to FIG. 3, in a further illustrative embodiment UCE functionality 100' may be embedded in an appliance, for example STB/DVR 310. In this example, remote control 102 and/or smart device 104 may transmit wireless request signals directly to STB/DVR 310 for action by the built-in UCE function 100', which actions may, as before, comprise CEC command transmissions via HDMI connection 112 or IR command transmissions 114, originat-

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ing in this instance from an IR blaster provisioned to the STB/DVR appliance 310. In this configuration, a set up application resident in STB/DVR 310 may be utilized to configure UCE 100', using for example an Internet connection 304 accessible through a cable modem and/or cable distribution system headend.

In the further illustrative embodiment of FIG. 4, UCE functionality 100' may be embedded in an AV receiver 420 which may serve as an HDMI switch between various content sources such as a STB/DVR 110 or a DVD player 108 and a rendering device such as TV 106. In addition to HDMI inputs, AV receiver 420 may also support various other input formats, for example analog inputs such as the illustrative 404 from CD player 408; composite or component video; S/PDIF coaxial or fiberoptic, etc. In this embodiment, request signals 406 may be directed to AV receiver 420, for example from remote control 402, for action by UCE function 100'. As before, resulting appliance commands may be transmitted using CEC signals transmitted over HDMI connections 112, or via IR signals 114 transmitted from an associated IR blaster. As appropriate for a particular embodiment, initial configuration of UCE 100' to match the equipment to be controlled may be performed by an Internet-connected app resident in AV receiver 420, or by an app resident in tablet computer 202 or other smart device, as mentioned previously in conjunction with FIG. 2.

As will be appreciated, various other configurations are also possible without departing from the underlying UCE concept, for example UCE function 100' may be incorporated into an Internet-capable TV, an HDMI switch, a game console, etc.; appliance command set and capability database 207 may be located at an internet cloud or a cable system headend, may be stored locally (in all or in part), which local storage may take the form of internal memory within the UCE itself or in an appliance such as a TV, STB or AV receiver, or may take the form of a memory stick or the like attachable to a smart device or appliance; etc.

With reference to FIG. 5, an exemplary UCE device 100 (whether stand alone or in an appliance supporting UCE functionality) may include, as needed for a particular application, a processor 500 coupled to a memory 502 which memory may comprise a combination of ROM memory, RAM memory, and/or non-volatile read/write memory and may take the form of a chip, a hard disk, a magnetic disk, an optical disk, a memory stick, etc., or any combination thereof. It will also be appreciated that some or all of the illustrated memory may be physically incorporated within the same IC chip as the processor 500 (a so called "micro-controller") and, as such, it is shown separately in FIG. 5 only for the sake of clarity. Interface hardware provisioned as part of the exemplary UCE platform may include IR receiver circuitry 504 and IR transmitter circuitry 506; an HDMI interface 508; a WiFi transceiver and interface 510; an Ethernet interface 512; and any other wired or wireless I/O interface(s) 514 as appropriate for a particular embodiment, by way of example without limitation Bluetooth, RF4CE, USB, Zigbee, Zensys, X10/Insteon, HomePlug, HomePNA, etc. The electronic components comprising the exemplary UCE device 100 may be powered by an external power source 516. In the case of a standalone UCE device such as illustrated in FIG. 1 or 2, this may comprise for example a compact AC adapter "wall wart," while integrated UCE devices such as illustrated in FIG. 3 or 4 may draw operating power from the appliance into which they are integrated. It will also be appreciated that in the latter case, in certain embodiments processor 500 and/or memory 502

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and/or certain portions of interface hardware items 504 through 514 may be shared with other functionalities of the host appliance.

As will be understood by those skilled in the art, some or all of the memory 502 may include executable instructions that are intended to be executed by the processor 500 to control the operation of the UCE device 100 (collectively, the UCE programming) as well as data which serves to define the necessary control protocols and command values for use in transmitting command signals to controllable appliances (collectively, the command data). In this manner, the processor 500 may be programmed to control the various electronic components within the exemplary UCE device 100, e.g., to monitor the communication means 504, 510 for incoming request messages from controlling devices, to cause the transmission of appliance command signals, etc. To cause the UCE device 100 to perform an action, the UCE device 100 may be adapted to be responsive to events, such as a received request message from remote control 102 or smart device 104, changes in connected appliance status reported over HDMI interface 508, WiFi interface 510, or Ethernet interface 512, etc. In response to an event, appropriate instructions within the UCE programming may be executed. For example, when a command request is received from a smart phone 104, the UCE device 100 may retrieve from the command data stored in memory 502 a preferred command transmission medium (e.g., IR, CEC over HDMI, IP over WiFi, etc.) and a corresponding command value and control protocol to be used in transmitting that command to an intended target appliance, e.g., TV 106, in a format recognizable by that appliance to thereby control one or more functional operations of that appliance. By way of further example, the status of connected appliances, e.g., powered or not powered, currently selected input, playing or paused, etc., as may be discerned from interfaces 508 through 514, may be monitored and/or tabulated by the UCE programming in order to facilitate adjustment of appliance settings to match user-defined activity profiles, e.g., "Watch TV", "View a movie", etc.

An overview of an exemplary UCE control environment is presented in FIG. 6. The UCE programming of an exemplary UCE device 100 may comprise a universal control engine core 650 together with a series of scalable software modules 652 through 660, each module supporting a particular appliance command protocol or method and provisioned as appropriate for a particular embodiment. By way of example, the illustrative embodiment of FIG. 6 may include an internet protocol (IP) module 652, a CEC over HDMI module 654, a Bluetooth module 656, an IR module 660, and other modules(s) 658, as appropriate for the particular application. The appliances to be controlled may include an IP enabled AV receiver 620, an IP enabled STB/DVR 610, TV 106, DVD player 108, and CD player 408. As illustrated, certain of these devices may be interconnected via HDMI 112 and/or Ethernet 670 interfaces. (In this regard, it should be appreciated that the illustrative interconnections 112 and 670 of FIG. 6 are intended to depict logical topography only, and accordingly details of exact physical cabling structure and/or the presence of any necessary switches, routers, hubs, repeaters, interconnections, etc., are omitted for the sake of clarity.)

The preferred method/protocol/medium for issuance of commands to the exemplary appliances of FIG. 6 may vary by both appliance and by the function to be performed. By way of example, volume control and analog input selection commands 622 targeted to AV receiver 620 may be required to be issued via IR transmissions, while power on/off and

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HDMI input selection functionality commands 624 may be better communicated via CEC commands and advanced functionality commands 626 such as sound field configuration may be best communicated via an Ethernet connection. In a similar manner, the various operational functions of the other appliances may best be commanded via a mixture of mediums, methods, and protocols, as illustrated. As will be appreciated, in some instances a particular appliance may support receipt of an operational command via more than one path, for example the power on/off function of AV receiver 620 may be available not only as a CEC command, but also via an IR command. In such instances, the UCE preferred command format may be that which has been determined to offer the greatest reliability, for example in the above instance the CEC command may be preferred since this form of command is not dependent on line-of-sight and also permits confirmation that the action has been performed by the target appliance.

In order to determine the optimum method for each configured appliance type and command, the exemplary UCE core program 650 may be provisioned with a preferred command matrix 700, as illustrated in FIG. 7. Exemplary preferred command matrix 700 may comprise a series of data cells or elements, e.g. cells 712, each corresponding to a specific command 702 and a specific one of the appliances to be controlled 704. The data content of such a cell or element may comprise identification of a form of command/transmission to be used and a pointer to the required data value and formatting information for the specific command. By way of example, the data element 712 corresponding to the "Input 2" command 706 for the configured TV appliance 708, may comprise an indicator that a CEC command is to be used, i.e., an indicator of the transmission device that is to be used to communicate the command to the intended target appliance, together with a pointer to the appropriate command data value and HDMI-CEC bus address; while data element 714 corresponding to the same command function for the configured AV receiver 710 may comprise an indicator that an IR command is to be used, together with a pointer to appropriate command data and formatting information within an IR code library stored elsewhere in UCE memory 502. In certain embodiments one or more secondary command matrices 716 may also be provisioned, allowing for the use of alternate command methods in the event it is determined by the UCE programming that a preferred command was unsuccessful. Command matrix 700 may also contain null entries, for example 718, where a particular function is not available on or not supported by a specific appliance. In an exemplary embodiment, command matrix 700 may be created and loaded into the memory 502 of UCE 100 during an initialization and set-up process, as will now be described in further detail.

In order to perform initial configuration of a UCE device, a setup application may be provided. In some embodiments, such a set up application may take the form of programming to be executed on any convenient device with a suitable user interface and capable of establishing communication with the UCE, such as without limitation a smart phone, tablet computer, personal computer, set top box, TV, etc., as appropriate for a particular embodiment. In other embodiments such a set up application may be incorporated into the UCE programming itself, utilizing for example a connected TV screen and an associated controlling device as the user interface. Regardless of the exact form and location of the programming and user interface means, the series of steps which may be performed by a UCE set up application when configuring a UCE device for operation with a specific set of

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appliances remains similar. Accordingly, it will be appreciated that the methods comprising the illustrative UCE set up application presented below in conjunction with FIGS. 8 and 9 may be generally applied, mutatis mutandis, to various alternative set up application embodiments.

With reference to FIG. 8, as known in the art a tablet computer such as the exemplary device 202 of FIG. 2 may comprise, as needed for a particular application, a processor 800 memory 802 which memory may comprise a combination of ROM memory, RAM memory, and/or non-volatile read/write memory and may take the form of a chip, a hard disk, a magnetic disk, an optical disk, a memory stick, etc., or any combination thereof. In some embodiments, provision may also be made for attachment of external memory 804 which may take the form of an SD card, memory stick, or the like. Hardware provisioned as part of an exemplary tablet computer platform may include an LCD touchscreen 810 with associated display driver 806 and touch interface 808; hard keys 812 such as for example a power on/off key; a USB port 816; WiFi transceiver and interface 818; a Bluetooth transceiver and interface 820; a camera 822; and various other features 824 as appropriate for a particular embodiment, for example an accelerometer, GPS, ambient light sensor, near field communicator, etc. The electronic components comprising the exemplary tablet computer device 202 may be powered by a battery-based internal power source 814, rechargeable for example via USB interface 816.

Memory 802 may include executable instructions that are intended to be executed by the processor 800 to control the operation of the tablet computer device 202 and to implement various functionalities such as Web browsing, game playing, video streaming, etc. As is known in the art, programming comprising additional functionalities (referred to as "apps") may be downloaded into tablet computer 202 via, for example, WiFi interface 818, USB 816, external memory 804, or any other convenient method. As discussed previously, one such app may comprise a remote control app, for example as that described in co-pending U.S. patent application Ser. No. 13/329,940 of like assignee and incorporated herein by reference in its entirety, which app may be for use in commanding the operation of appliances 106, 108, 110 and/or 120 via UCE device 100. In order to initially configure UCE device 100 to match the appliances to be controlled and to establish an appropriate command matrix, tablet computer 202 may also be provisioned with a setup app 214, either as part of a remote control app or as separately downloadable item.

With reference now to FIG. 9 such a setup app, upon being invoked at step 902 may initially request that the user place all of the appliances to be controlled into a known state, e.g., powered on, in order to enable the appliance detection and/or testing steps which follow. Next, at step 904 the setup app may determine the identity of those appliances which are CEC-enabled. This may be accomplished by communicating a request to the associated UCE, which at step 906 which may cause the UCE programming to scan connected HDMI devices for appliances which are CEC-enabled and/or identifiable via interaction over the HDMI interface, for example as described in co-pending U.S. patent application Ser. No. 13/198,072, of like assignee and incorporated herein by reference in its entirety, and communicate such appliance identities to the setup application. Thereafter, at step 904 the setup application may determine if additional non-CEC appliances are connected to the UCE device via the HDMI interface. This may be accomplished by requesting the UCE programming to scan for any further

HDMI connections at step 910 and communicate the findings back to the setup application. Though not illustrated, it will be appreciated that where appropriate for a particular embodiment the UCE programming may conduct similar scans in order to discover appliances connected via Ethernet, USB, Bluetooth, RF4CE, WiFi etc., where such interfaces may be provisioned to a UCE.

Thereafter, at step 912 the setup application may display a listing of detected appliances (both identified and not yet identified) to the user. At step 914, the user may be prompted to enter appliance identifying information for those HDMI or otherwise connected appliances which were detected but not identified, as well as identifying information regarding any additional appliances which may form part of the system to be controlled but are not discoverable as described above (for example appliances such as AV receiver 120 or CD player 408 which may be responsive only to unidirectional IR commands). Without limitation, such identifying information may take the form of user-entered data such as an appliance type, brand and model number, or a setup code from a listing in a user guide; or may take the form of scanned or electronic information such as a digital picture of the appliance itself or of a bar code, QR code, or the like associated with appliance; near field acquisition of RFID tag data; etc., or any combination thereof as appropriate for a particular embodiment.

Once appropriate identifying information has been acquired, at step 916 the setup app may communicate that information to a database server, for example server 206, for performance of step 918, comprising identification of and retrieval of command codeset and capability data corresponding to the identified appliances from a database 207, and provision of this data to the setup application for processing and ultimate transfer to the UCE device. As will be appreciated, the transferred codeset data may comprise complete command data values and formatting information, may comprise pointers to command data values and formatting information already stored in the memories 502 and/or 802/804 of the UCE or the device upon which the setup application is currently resident, or a combination thereof. Where necessary, for example when database 207 may contain alternate codesets for an identified appliance, or where uncertainty exists regarding a particular appliance model number, etc., at steps 920, 922, and 924 various control paradigms and/or command data sets may be tested against the appliances to be controlled. Such testing may take the form of soliciting user response to effects observable commands, monitoring of HDMI interface status changes as described for example in U.S. patent application Ser. No. 13/240,604, of like assignee and incorporated herein by reference in its entirety, or any other method as convenient for a particular application. Once appropriate codesets have been fully determined, at steps 926, 928 and 930 a suitable preferred command matrix, for example as illustrated in FIG. 7, may be constructed and stored into the memory 502 of exemplary UCE device 100, the matrix being constructed by considering the communication capabilities and functionalities of the devices identified via the above-described processes.

In order to select the optimum command method for each function of each configured appliance any suitable method may be utilized, for example a system-wide prioritization of command media and methods by desirability (e.g. apply IP, CEC, IR in descending order); appliance-specific command maps by brand and/or model; function-specific preference and/or priority maps (e.g. all volume function commands via IR where available); etc.; or any combination thereof. The

exact selection of command method priorities or mapping may take into account factors such connection reliability, e.g. wired versus wireless, bidirectional versus unidirectional communication, etc.; speed of command transmission or execution; internal priorities within an appliance, e.g. received IP received packets processed before CEC packets, etc.; type of protocol support (e.g. error correction versus error detection; ack/nak, etc.); or any other factors which may be applied in order to achieve optimum performance of a particular embodiment.

As will be appreciated, the construction of said preferred command matrix may be performed at the database server or within the setup application, or a combination thereof, depending on the particular embodiment. Once a preferred command matrix has been finalized and stored in the UCE device, at step 932 a series of desired appliance configurations associated with specific user activities may be configured and stored into the UCE device, as will be now be described.

Upon completion and storage of a preferred command matrix, an exemplary setup application may subsequently guide a user through a series of steps in order to establish the desired appliance configurations for a series of possible activities. With reference to FIG. 10, at step 1002, the user may be presented with a list of possible activities, e.g., "Watch TV", "Watch a movie", "Listen to music", etc. In some embodiments, the user may also be able to edit activity titles and/or create additional user defined activities. At step 1004 a user may select a particular activity for configuration, for example "Watch TV". At step 1006, the user may be prompted to identify the content source for the activity being configured, for example cable STB/DVR 110 for the exemplary "Watch TV" activity. Such a prompt may take the form of a listing of eligible appliances as determined during the foregoing appliance set up steps; explicit user entry of an appliance type; etc. Next, at steps 1008 the user may be prompted in a similar manner to select video and audio rendering appliances for use in this activity, for example TV 106 and AVR receiver 120 respectively. Depending upon the system topography and the interfaces in use (i.e. HDMI/CEC, IP, analog, etc.) the set up application in concert with UCE programming may be able to ascertain which input port of each rendering appliance is attached to the content source appliance identified for this activity and/or if any intermediate switching appliance is in use (for example AV receiver 420 of the system illustrated in FIG. 4). Where such information is obtainable, the set up application may automatically create all or part of an appropriate rendering device input selection for the activity being configured. If not, at steps 1008 and 1010, the user may be additionally requested to identify the applicable content route(s) to the rendering appliances, e.g., input port numbers, presence of intermediate switches, etc. During or upon conclusion of steps 1004 through 1010, the set up application may construct an activity matrix, for example as illustrated in FIG. 11. By way of example, activity matrix 1100 for a "Watch TV" activity may comprise a series of cells, for example 1110 or 1112, each corresponding to a desired configuration of a particular state 1106 or function 1108 of a specific appliance 1104 during the specified activity. By way of example, cell 1110 may indicate that the input of AV receiver 120 is to be set to "S/PDIF2", while cells 1112 and 1114 may indicate that transport function commands (e.g., "play", "pause", "fast forward" etc.) are to be directed to STB/DVR 110 and not to DVD 114. In this regard, it will be appreciated that while in some embodiments the assignment of functions such as, for example, volume control, to specific appliances

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during a particular activity may be performed within an individual controlling device, i.e., the controlling device may determine the appliance to which volume control commands are to be directed, in a preferred embodiment this assignment may be performed to within the UCE, thereby ensuring consistency across each activity when multiple controlling devices are present in an environment, for example devices 102 and 104 of the environment illustrated in FIG. 1.

Returning now to FIG. 10, at steps 1014 and 1016 the newly-constructed activity matrix 1100 may be tested by causing the UCE programming, utilizing preferred command matrix 700, to issue the commands necessary to place the identified appliances into the desired state and thereafter receiving verification at step 1018 that the desired activity was successfully initiated. It will be appreciated that such verification may comprise, for example, detection and reporting of HDMI or other content streams and/or appliance status by UCE programming by directly monitoring CEC status or by using methods such as described for example in U.S. patent application Ser. No. 13/240,604; solicitation of user input confirming correct operation; monitoring for presence or absence of analog input signals; recording of appliance status or error messages; etc.; or any combination thereof as appropriate for a particular embodiment.

If testing is unsuccessful, at step 1018 the set up application may return to step 1002 to allow reconfiguration of that activity and/or definition of alternative activities. If testing was successful, at steps 1020 and 1022 the completed activity matrix, for example 1100 as illustrated in FIG. 11, may be transferred to the UCE 100 for storage in UCE memory 502. Thereafter, at step 1024 the user may be offered the opportunity to return to step 1002 to define additional activity configurations, for example 1101, 1102 as illustrated in FIG. 11, or to exit the activity configuration process.

With reference now to FIG. 13, the series of steps performed by the UCE programming in order to convey a function command to an appliance in accordance with a command request 1300 received from a controlling device such as remote control 102 or 200, smart device 104 or 202, etc., or in accordance with an internally generated requirement resulting from receipt of an activity request (as will be described hereafter) may initially comprise retrieval from a preferred command matrix that data element which corresponds to the requested command and target appliance. By way of specific example, receipt of a "TV power on" request from remote control 102 or the like at a UEC provisioned with the preferred command matrices illustrated in FIG. 7 may cause retrieval of data element 720, indicating that the command is to be communicated to the TV appliance, e.g., television 106, using an HDMI CEC command. At step 1304, the UCE programming may determine if the retrieved value constitutes a null element. If so, the referenced appliance does not support the requested command and accordingly at step 1314 an error message may be generated and the process thereafter terminated. As will be appreciated, the exact nature of such an error message may depend upon the particular embodiment and/or the requesting controlling device: for example, if the request originated from a controlling device which is in bidirectional communication with the UCE the error may be communicated back to the requesting device for action, i.e., display to the user, illuminate a LED, activate a buzzer, etc. as appropriate. Alter-

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natively, in those embodiments where a UCE is incorporated into an appliance, that appliance's front panel display may be utilized.

If the retrieved preferred command matrix element data is valid, at step 1306 the UCE may communicate the corresponding function command to the target appliance using the indicated command value and transmission method, e.g., for the exemplary data element 720 this may comprise issuing a CEC "power on" command to CEC logical device address zero (TV) via the UCE HDMI interface 508. Once the command has been issued, at step 1308 the UCE programming may determine if the communication interface and protocol used in issuing the command provides for any confirmation mechanism, i.e., explicit acknowledgement of receipt, monitoring of HDMI status on an interface, detection of a media stream or HDCP handshake, etc. If not, for example the command was issued using a unidirectional IR signal and no other confirmation means such as power or input signal monitoring is available, the UCE programming may simply assume that the command was successful and processing is complete. If however confirmation means exists, at step 1310 the UCE programming may wait to determine if the command was successfully executed. Once positive confirmation is received, processing is complete. If no confirmation or a negative confirmation is received, at step 1312 the UCE programming may determine if an alternative method is available to communicate the command to the target appliance. Returning to the specific example presented above this may comprise accessing a secondary command matrix 716 in order to determine if an alternative communication method is available for the specific function, e.g., "TV power on." If an alternative does exist, at step 1316 the substitute command value and transmission method may be retrieved and processing may return to step 1306 to initiate an alternative attempt. Returning again to the specific example, if the CEC "power on" command corresponding to data element 720 of matrix 700 issued to TV 106 cannot be confirmed, an IR "power on" command encoded according to SIRCS (Sony Infrared Control System) in correspondence with the equivalent data element in secondary matrix 716 may be attempted as a substitute.

In addition to relaying individual command requests as described above, an exemplary UCE may also support activity selection, whereby receipt of a single user request from a controlling device may cause a series of commands to be issued to various appliances in order to configure a system appropriately for a particular user activity, such as for example, watching television. To this end a set of matrices defining desired equipment states suitable to various activities, for example as illustrated at 1100 through 1102 of FIG. 11, may be stored in UCE memory 502 for access by UCE programming when executing such a request. As illustrated in FIG. 12, in some embodiments the programming of an exemplary UCE may maintain an additional matrix 1200 representative of the current state of the controlled appliances, arranged for example by appliance 1202 and by operational state 1204. By way of example, data elements 1206 and 1208 in the illustrative table 1200 may indicate that TV 106 is currently powered on (1208) with HDMI port number 2 selected as the input (1206). The data contents of the elements in such a table may be maintained in any convenient manner as appropriate to a particular embodiment, for example without limitation retrieval of HDMI/CEC status; monitoring input media streams and/or HDCP status; measuring power consumption; construction of a simulated appliance state such as described for example

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in U.S. Pat. No. 6,784,805; etc.; or any combination thereof. In the case of certain appliances, such as for example AV receiver 120 which may be controllable only via unidirectional IR, the current state of the appliance may not be discernible. In such cases, a null data element 1210 may be entered into exemplary matrix 1200 to indicate that this appliance may require configuration using discrete commands only and/or user interaction. As will be appreciated, in some embodiments the data contents of the illustrative table may be maintained in memory 502 on an ongoing basis by UCE programming, while in other embodiments this data may be gathered "on the fly" at the time the activity request is being processed. Combinations of these methods may also be used, for example "on the fly" gathering for appliances connected via an HDMI bus combined with maintenance of a simulated state for appliances controlled via IR signals.

In order to configure a group of appliances for a desired activity, UCE programming may compare a desired state matrix, for example 1100, to a current state matrix, for example 1200, element by element, issuing commands as necessary to bring appliances to the desired state. By way of example, an exemplary series of steps which may be performed by the programming of a UCE in order to effect a "Watch TV" activity configuration will now be presented in conjunction with FIG. 14. For the purposes of this example, the reader may also wish to reference the equipment configuration of FIG. 1 and the activity and current state matrices 1100 and 1200 of FIGS. 11 and 12.

Upon receipt of a "Watch TV" request 1400, at step 1402 the exemplary UCE programming may access an applicable appliance state matrix 1100. Next, at step 1404 it may be determined by the UCE programming whether the present "power" state of TV 106 as indicated by current state matrix 1200 matches the desired state stored in the corresponding data element of matrix 1100. If the states match, processing may continue at step 1408. If the states do not match, at step 1406 a "power on" command may be communicated to TV 106. As will be appreciated from the earlier discussion in conjunction with FIG. 13 and inspection of exemplary preferred command matrix 700, in the illustrative system communication of the "power on" command to TV 106 may comprise a CEC command issued over HDMI connection 112. Next, at step 1408 a "mute" command may be communicated to TV 106, since element 1116 of illustrative matrix 1100 indicates that TV 106 is not the primary audio rendering appliance. In accordance with preferred command matrix 700, communication of the "mute" command to TV 106 may comprise an IR transmission 114. Thereafter, at steps 1410, 1412 the active input of TV 106 may be set to "HDMI1" via a CEC command, and at steps 1414, 1416 a CEC "power on" command may be communicated to STB/DVR 110 if that appliance is not already powered on. At step 1418, the exemplary UCE programming may set an internal status to indicate that future transport command requests (e.g., play, pause, FF, etc.) should be routed to STB/DVR 110, as indicated by element 1112 of matrix 1100. Thereafter, at steps 1420, 1422 a CEC "power off" command may be communicated to STB/DVR 108 if that appliance is not already powered off. Thereafter, at steps 1424 and 1426 "power on" and "input S/PDIF2" commands may be communicated to AV receiver 120 via IR signals. As will be appreciated, it may not be possible to determine the current status of AV receiver 120, as indicated for example by elements 1210 and 1220 of matrix 1200, and accordingly so-called "discrete," or explicit, function commands may be issued which may establish the desired status regardless of the current state of the appliance. Finally, at step 1428 the

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exemplary UCE programming may set an internal status to indicate that future volume control command requests (e.g., volume up/down, mute) should be routed to AV receiver 120, as indicated by element 1118 of matrix 1100, where after processing of the activity request is complete.

As noted above, the exemplary UCE may also support activity selection, whereby receipt of a single user request from a smart device may cause a series of commands to be issued to various appliances in order to configure a system appropriately for one or more user activities, such as "watch TV," "watch movie," "listen to music," etc. To setup the user interface of the smart device to support such macro command functionality, an exemplary method is illustrated in FIG. 15. More particularly, with reference to FIG. 15, upon invocation of a setup app at step 1502 a user may be requested to place all of the appliances to be controlled into a known state, e.g., powered on or already joined in a wireless network, in order to enable the appliance detection and/or testing steps which follow. Next, at step 1504 the setup app may determine the identity of those appliances which are CEC-enabled or IP enabled. This may be accomplished by communicating a request to the associated UCE, which at step 1506 may cause the UCE programming to scan connected HDMI devices for appliances which are CEC-enabled and/or identifiable via interaction over the HDMI interface, for example as described in co-pending U.S. patent application Ser. No. 13/198,072, of like assignee and incorporated herein by reference in its entirety, and communicate such appliance identities to the setup application. Next, at step 1508 the setup app may also determine if the appliances has any associated icon information (for example stored as metadata on the appliance, available from a remote server, or the like) as well as information related to interface connection types, e.g., WI-FI, HDMI input/output, for use in the creation of supported macros. If the icon information is available, the icon information may be sent to the smart device by the appliance and/or retrieved by the smart device using other information provided by the appliance as appropriate as shown in step 1526. An icon corresponding to the icon information may then be automatically added to the user interface of the smart device whereupon an activation of the added icon may be used to provide access to command and control functionalities associated with the corresponding controllable device, including commands in the form of a listing of automatically generated macros available for that controllable device as described below. Thus, icon information provided to the smart device may be used in connection with information stored on the smart device, stored in the internet cloud and/or at a remote server to automatically add an icon to the user interface of the smart device where the icon can be in the form of a logo for the controllable appliance, icons in the form of logos for content (e.g., television station logos) that can be accessed via the controllable appliance, etc. In a further illustrative embodiment, icons may function as soft keys which may be selected to cause the performance of a further action for example, to display a device control page (e.g., to present television control soft keys such as channel up, channel down, etc.), cause the transmission of commands, etc. as described for example in U.S. patent application Ser. No. 10/288,727, (now U.S. Pat. No. 7,831,930) of like assignee and incorporated herein by reference in its entirety, or any other method as convenient for a particular application.

The setup application then continues to step 1510 (after scanning for CEC connected appliances as discussed above) whereat the setup application may next determine if additional non-CEC appliances are connected to the UCE device

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via the HDMI interface. This may be accomplished by requesting the UCE programming to scan for any further HDMI connections at step 1512 and communicate the findings back to the setup application. Though not illustrated, it will be appreciated that, where appropriate for a particular embodiment, the UCE programming may conduct similar scans in order to discover appliances connected via Ethernet, USB, Bluetooth, RF4CE, WiFi etc., where such interfaces may be provisioned to a UCE.

Thereafter, at step 1514 the setup application may display a listing of detected appliances (both identified and not yet identified) to the user. At step 1516, the user may then be prompted to enter appliance identifying information for those HDMI or otherwise connected appliances which were detected but not identified, as well as identifying information regarding any additional appliances which may form part of the system to be controlled but which were not discoverable as described above (for example appliances such as AV receiver 120 or CD player 408 which may be responsive only to unidirectional IR commands). Without limitation, such identifying information may take the form of user-entered data such as an appliance type, brand and model number, or a setup code from a listing in a user guide; or may take the form of scanned or electronic information such as a digital picture of the appliance itself or of a bar code, QR code, or the like associated with appliance; near field acquisition of RFID tag data; MAC address; etc.; or any combination thereof as appropriate for a particular embodiment.

Once appropriate identifying information has been acquired, at step 1518 the setup app may communicate that information to a database server, for example server 206, for performance of step 1520 in which the database server uses the identification information to retrieve icon information as needed (e.g., when such data was not obtainable from the appliance), command information as discussed previously, and in step 1522, to automatically generate macros which correspond to the appliance or a plurality of appliances considering their capability data as maintained in a database 207 and/or as retrieved from the appliances. Any such data gathered from and/or created by the server 206 will then be provisioned to the setup application for processing and ultimate transfer to the smart device and/or UCE as required. As will be appreciated, the transferred information and/or metadata may comprise complete command data values, appliance input/output data and current status, formatting information, pointers to command data values and formatting information already stored in the memories 502 and/or 802/804 of the UCE or the device upon which the setup application is currently resident, etc. Where necessary, for example when database 207 may contain alternate codesets, icon metadata, or macro information for an identified appliance, or where uncertainty exists regarding a particular appliance model number, etc., at steps 1528, 1530, and 1522 various control paradigms and/or command data sets may be tested against the appliances to be controlled. Such testing may take the form of soliciting user response to effects observable commands, monitoring of HDMI interface status changes as described for example in U.S. patent application Ser. No. 13/240,604, of like assignee and incorporated herein by reference in its entirety, or any other method as convenient for a particular application. Once appropriate codesets and macro operations have been fully determined, at steps 1528 and 1530 a suitable preferred user profile 1524, may be constructed and stored into the memory 502 of exemplary UCE device 100, the user profile 1524 being

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constructed by considering the communication capabilities and functionalities of the devices identified via the above-described processes.

In order to select the optimum command method for each function of each configured appliance any suitable method may be utilized, for example a system-wide prioritization of command media and methods by desirability (e.g. apply IP, CEC, IR in descending order); appliance-specific command maps by brand and/or model; function-specific preference and/or priority maps (e.g. all volume function commands via IR where available); etc.; or any combination thereof. The exact selection of command method priorities or mapping may take into account factors such as connection reliability, e.g. wired versus wireless, bidirectional versus unidirectional communication, etc.; speed of command transmission or execution; internal priorities within an appliance, e.g. received IP received packets processed before CEC packets, etc.; type of protocol support (e.g. error correction versus error detection; ack/nak, etc.); or any other factors which may be applied in order to achieve optimum performance of a particular embodiment.

As will be appreciated, the construction of said user profile 1524 may be performed at the database server or within the setup application, or a combination thereof, depending on the particular embodiment.

While various concepts have been described in detail, it will be appreciated by those skilled in the art that various modifications and alternatives to those concepts could be developed in light of the overall teachings of the disclosure. For example, in an alternate embodiment of UCE functionality, in place of a preferred command matrix such as illustrated in FIG. 7, the programming of an exemplary UCE may utilize a command prioritization list, for example a prioritization list "IP, CEC, IR" may cause the UCE programming to first determine if the requested command can be issued using Internet Protocol, only if not, then determine if the requested command can be issued using a CEC command over the HDMI interface, and only if not, then attempt to issue the requested command via an infrared signal. Such a prioritization reflects an exemplary preference of using bi-directional communication protocols over unidirectional communication protocols over line of sight communication protocols, e.g., IR, when supported by the intended target appliance.

Further, while described in the context of functional modules and illustrated using block diagram format, it is to be understood that, unless otherwise stated to the contrary, one or more of the described functions and/or features may be integrated in a single physical device and/or a software module, or one or more functions and/or features may be implemented in separate physical devices or software modules. It will also be appreciated that a detailed discussion of the actual implementation of each module is not necessary for an enabling understanding of the invention. Rather, the actual implementation of such modules would be well within the routine skill of an engineer, given the disclosure herein of the attributes, functionality, and inter-relationship of the various functional modules in the system. Therefore, a person skilled in the art, applying ordinary skill, will be able to practice the invention set forth in the claims without undue experimentation. It will be additionally appreciated that the particular concepts disclosed are meant to be illustrative only and not limiting as to the scope of the invention which is to be given the full breadth of the appended claims and any equivalents thereof.

All patents cited within this document are hereby incorporated by reference in their entirety.

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What is claimed is:

1. A first media device, comprising:
 - a processing device;
 - a high-definition multimedia interface communications port, coupled to the processing device, for communicatively connecting the first media device to a second media device;
 - a transmitter, coupled to the processing device, for communicatively coupling the first media device to a remote control device; and
 - a memory device, coupled to the processing device, having stored thereon processor executable instruction; wherein the instructions, when executed by the processing device, cause the first media device to be configured to transmit a first command directly to the second media device, via use of the high-definition multimedia communications port, to control an operational function of the second media device when a first data provided to the first media device indicates that the second media device will be responsive to the first command, and cause the first media device to be configured to transmit a second data to a remote control device, via use of the transmitter, for use in configuring the remote control device to transmit a second command directly to the second media device, via use of a communicative connection between the remote control device and the second media device, to control the operational function of the second media device when the first data provided to the first media device indicates that the second media device will be unresponsive to the first command.
2. The first media device as recited in claim 1, wherein the second media device comprises a media source device for the first media device acting as a media sink device and wherein the first media device receives media data from the media source device via use of the high-definition multimedia interface communications port.
3. The first media device as recited in claim 1, wherein the second media device comprises a media sink device for the first media device acting as a media source device and wherein the first media device transmits media data to the media sink device via use of the high-definition multimedia interface communications port.
4. The first media device as recited in claim 2, wherein the media sink device comprises a video rendering device.
5. The first media device as recited in claim 2, wherein the media sink device comprises a sound rendering device.
6. The first media device as recited in claim 3, wherein the media sink device comprises a video rendering device.
7. The first media device as recited in claim 3, wherein the media sink device comprises a sound rendering device.
8. The first media device as recited in claim 1, wherein the first command comprises command data formatted for transmission using a wired communications protocol and the second command comprises command data formatted for transmission using a wireless communications protocol.

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9. The first media device as recited in claim 8, wherein the wired communications protocol comprises a Consumer Electronics Control (CEC) communications protocol.

10. The first media device as recited in claim 8, wherein the wireless communication protocol comprises an infrared (IR) communications protocol.

11. The first media device as recited in claim 1, wherein the transmitter comprises a radio frequency (RF) transmitter.

12. The first media device as recited in claim 1, wherein the first data provided to the first media device comprises identity data received from the second media device.

13. The first media device as recited in claim 1, wherein the first data provided to the first media device comprises data indicative of a success status of a test command that was transmitted to the second media device.

14. The first media device as recited in claim 13, wherein the test command is transmitted to the second media device by the first media device via use of the high-definition multimedia interface communications port.

15. The first media device as recited in claim 13, wherein the test command comprises a command transmitted to test a volume functional operation of the second media device.

16. The first media device as recited in claim 12, wherein the first data provided to the first media device further comprises data indicative of a success status of a test command that was transmitted to the second media device.

17. The first media device as recited in claim 16, wherein the test command is transmitted to the second media device by the first media device via use of the high-definition multimedia interface communications port.

18. The first media device as recited in claim 16, wherein the test command comprises a command transmitted to test a volume functional operation of the second media device.

19. The first media device as recited in claim 13, wherein the instructions cause the first media device to be configured to monitor the high-definition multimedia interface communications port for a status and wherein the data indicative of the success status of the test command that was transmitted to the second media device comprises data indicative of the monitored status of the high-definition multimedia interface communications port.

20. The first media device as recited in claim 16, wherein the instructions cause the first media device to be configured to monitor the high-definition multimedia interface communications port for a status and wherein the data indicative of the success status of the test command that was transmitted to the second media device comprises the data indicative of the monitored status of the high-definition multimedia interface communications port.

21. The first media device as recited in claim 1, wherein the functional operation of the second media device comprises a volume functional operation of the media sink device.

22. The first media device as recited in claim 1, wherein the functional operation of the second media device comprises a power functional operation of the media sink device.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 10,593,196 B2
APPLICATION NO. : 16/197748
DATED : March 17, 2020
INVENTOR(S) : Paul D. Arling

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the Title Page

Item (72) Inventor: add --Brian Barnett, Oakland, CA (US)--

Signed and Sealed this
Fifteenth Day of December, 2020

A handwritten signature in black ink, appearing to read "Andrei Iancu".

Andrei Iancu
Director of the United States Patent and Trademark Office

CERTIFICATE OF COMPLIANCE

The undersigned certifies that this brief complies with the type-volume limitation of Federal Rule of Appellate Procedure 32(a)(7)(B). The brief contains 13,676 words, excluding the parts of the brief exempted by Federal Rule of Appellate Procedure 32(a)(7)(B)(iii). This brief complies with the typeface requirements of Federal Rule of Appellate Procedure 32(a)(5) and the type style requirements of Federal Rule of Appellate Procedure 32(a)(6). The brief has been prepared in a proportionally spaced typeface using Microsoft Word 365 in Times New Roman 14-point font.

/s/ Matthew J. Rizzolo

Matthew J. Rizzolo

Counsel for Roku, Inc.

FORM 31. Certificate of Confidential Material

Form 31
July 2020

**UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT**

CERTIFICATE OF CONFIDENTIAL MATERIAL

Case Number: 22-1386

Short Case Caption: Roku, Inc. v. ITC

Instructions: When computing a confidential word count, Fed. Cir. R. 25.1(d)(1)(C) applies the following exclusions:

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- For a responsive filing, do not count words marked confidential for the first time in the preceding filing.

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Date: 06/15/2022

Signature: /s/ Matthew J. Rizzolo

Name: Matthew J. Rizzolo